AIR ENGINEERING

FEBRUARY, 1960

AIR POLLUTION CONTROL • AIR MOVING • AIR CONDITIONING

High vs Low Velocity Air Conditioning Systems

All About Dust Collectors

3 Low Cost Ventilation Systems

Printing Press Ink Mist... How To Stop It With Engineered Air

THE UNIVERSITY OF MICHIGAN
FEB 11 1960
ENGINEERING LIBRARY

A new kind of practical engineering publication . . . dedicated to design, application, selection, installation and operation of equipment used in the engineering of air

AIR ENGINEERING

Check this chart to see how Air Engineering's circulation covers the air conditioning, air moving, and air pollution control markets

If you sell air moving equipment, industrial air conditioning equipment, or air pollution control equipment, use AIR ENGINEERING to influence these industry groups:

1. AIR ENGINEERING is read by over 6,000 Air Engineers and other executives in America's largest industrial organizations . . . the men who make decisions to buy!

2. AIR ENGINEERING reaches and influences over 2,300 Consulting Engineers, Architects and Mechanical Contractors . . . the men who design, specify and install equipment.

3. AIR ENGINEERING reaches over 1,700 code enforcement authorities, industrial hygienists, medical researchers and industrial engineering departments . . . the men who are constantly working to improve atmospheric conditions.

This adds up to a concentrated, specialized readership of over 10,000 men directly concerned with the increasingly complex problems of air.

By advertising in AIR ENGINEERING your product is studied by these men directly . . . and you reach them at a time when AIR ENGINEERING's editorial content is making them most aware of air problems. These are the men who are going to be the most vital influences in a growing market. Sell them on your product now!

CONTACT YOUR NEAREST REPRESENTATIVE for Market and Media File, full information and space reservations.

NEW YORK: MUrray Hill 2-1928-9
CHICAGO: FRanklin 2-8643-4
LOS ANGELES: AXminster 2-9501
DETROIT: WOodward 2-0924

PUBLISHED MONTHLY
CIRCULATION GUARANTEED 10,000

B = BUYERS
S = SPECIFIERS
R = RECOMMENDING OR APPROVING

	ENGINEERS IN INDUSTRIAL PLANTS, BUILDINGS, INSTITUTIONS	CONSULTING ENGINEERS AND ARCHITECTS	FEDERAL, STATE AND MUNICIPAL AUTHORITIES	EQUIPMENT MANUFACTURERS AND THEIR SALES OUTLETS	MECHANICAL CONTRACTORS
FANS AND BLOWERS	B	S	R	B	B
AIR FILTERS	B	S	R	B	B
AIR CONDITIONING EQUIPMENT	B	S	R		B
VENTILATORS AND EXHAUSTERS	B	S	R		B
STOKERS, BURNERS, ETC.	B	S	R		B
STACKS, CHIMNEYS	B	S	R		B
ODOR NEUTRALIZERS	B	S	R		B
CATALYTIC PURIFIERS	B	S	R	B	B
INCINERATORS AND WASTE BURNERS	B	S	R		B
GERMICIDAL RADIATION	B	S	R	B	B
DUST COLLECTORS	B	S	R		B
AIR WASHERS AND SCRUBBERS	B	S	R		B
SOLVENT RECOVERY SYSTEMS	B	S	R		B
FUME COLLECTORS	B	S	R		B
CONTROLS	B	S	R	B	B
TEST APPARATUS		B	B	B	B
ELECTRONIC AIR CLEANERS	B	S	R		B
DUCT WORK AND ACCESSORIES	B	S	R		B

FOR THESE INDUSTRIES

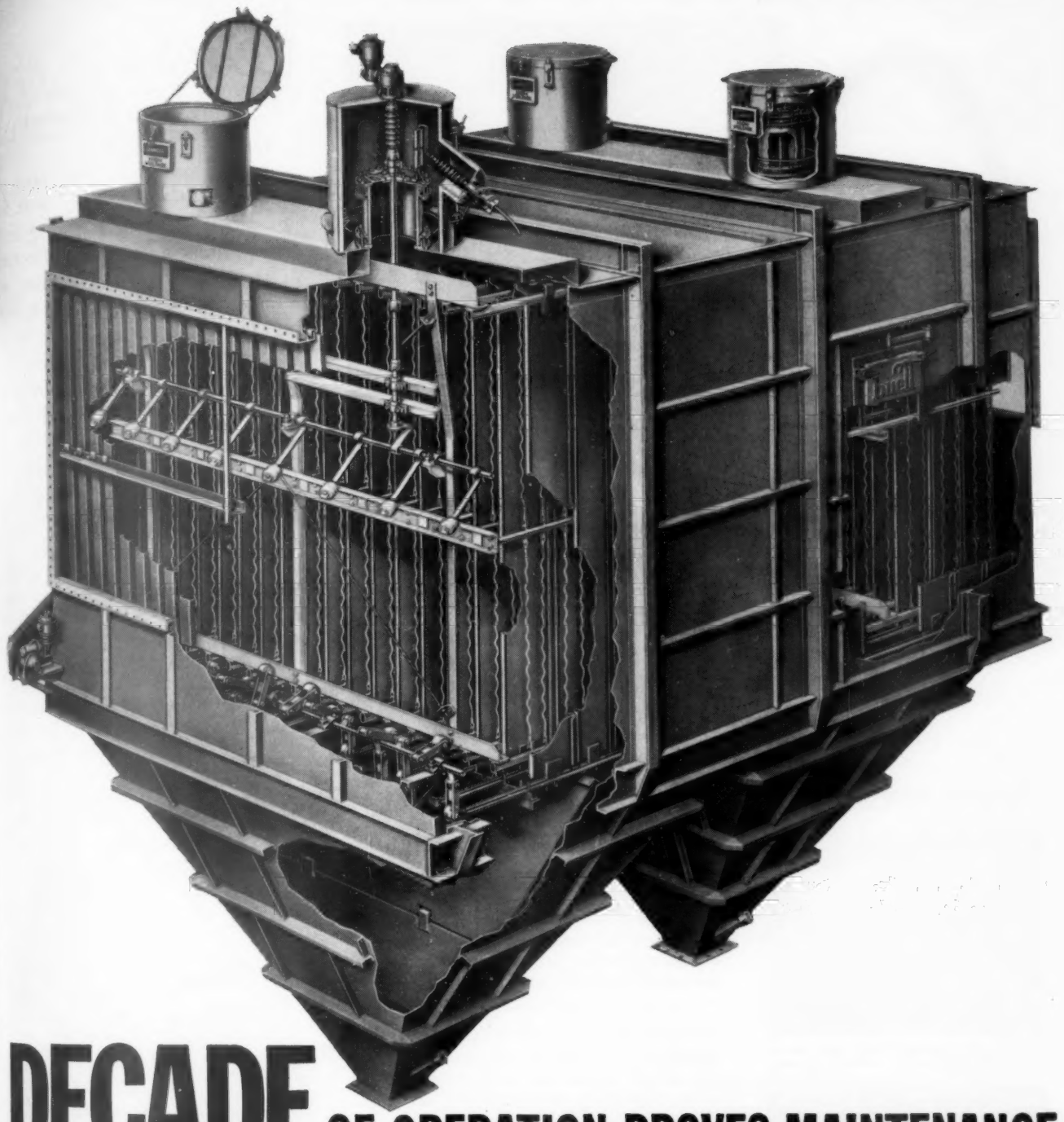
METALLURGICAL • NUCLEONICS • TEXTILES

FOODS • TRANSPORTATION • MINING • CHEMICAL

UTILITIES • PETROLEUM • METAL PRODUCTS

. . . or wherever air treatment or air control problems exist

BUSINESS NEWS PUBLISHING CO. FOUNDED 1926 430 WEST PORT ST., DETROIT 26, MICH.



DECADE OF OPERATION PROVES MAINTENANCE OF BUELL 'SF' PRECIPITATORS AVERAGE LESS THAN 2%

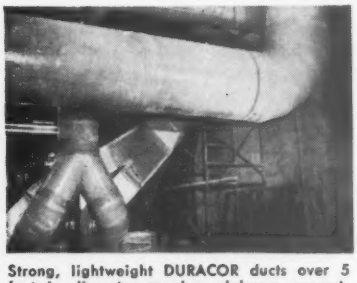
In 10 years of selling 'SF' electric precipitators, the number of replacement parts ordered from Buell has amounted to only 1.17% of the total sales! Even on emitting electrodes, usually the most vulnerable part of a precipitator, replacement has amounted to less than 1% of the original number installed. What do these extremely low percentages mean? Exceptionally low maintenance costs, for one thing, continuous high-efficiency operation, fewer shutdowns and process interruptions. Buell self-tensioned emitting Spiralectrodes eliminate vibration found in weight-tensioned wires. Buell's low maintenance precipitators will provide you with the most satisfactory operating results. They're backed by 25 years of experience in dust collection, with the practical know-how gained on hundreds of installations. Write for descriptive literature. The Buell Engineering Company, Inc., Dept. 62-B, 123 William Street, New York 38, New York. (Subsidiary: Ambuco Limited, London, England).

EXPERTS AT DELIVERING EXTRA EFFICIENCY IN DUST RECOVERY SYSTEMS.

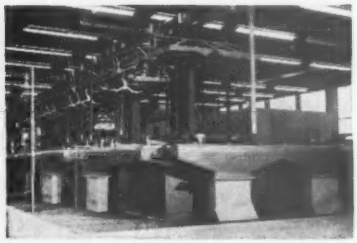
buell®

another corrosive fumes ventilating problem

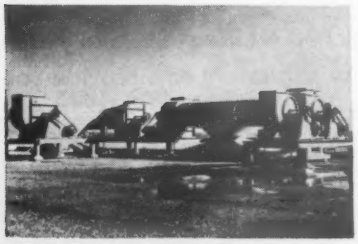
Duracor Ventilation System exhausts 250,000 C.F.M. of corrosive fumes from large electronic equipment plant.



Strong, lightweight DURACOR ducts over 5 feet in diameter require minimum support.



Corrosion-proof throughout, these DURACOR "drops" need no exterior protection from spillage.



Weather and corrosion resistance are provided by DURACOR "T" sections on roof.

PROBLEM: This ventilating system had to withstand sulphuric, nitric, chromic, phosphoric acid and cyanide fumes emitted from the plant's plating and anodizing operation.

SOLUTION: Working from customer specifications, Ceilcote engineers built the entire ventilating system shown here completely from DURACOR.

INSTALLATION: Experienced Ceilcote supervisors and crews handled the complete installation under one contract. Materials and workmanship are fully guaranteed.

WHAT'S YOUR PROBLEM? . . . DURACOR resists any corrosive gas, fume or liquid . . . can be fabricated to virtually any shape. Write today and tell us about your requirements.

DURACOR CEILCOTE

8019-CC

THE CEILCOTE COMPANY, INC.

4988 Ridge Road • Cleveland 9, Ohio

Letters

AE Is Big Help to Doctors

Editor:

AIR ENGINEERING has been a great help to me in my work in air conditioning and heating and I see a great help in it for Doctors in treating their allergy cases, so I think you would be wise in trying to get it in the hands of as many Doctors as possible. For the air engineer – design engineer and fabrication engineer it is a must.

Jack Hall
Hall Refrigeration
Manchester, Ky

Correction

In the article on page 18 of the November issue, mention was made of the word "capillary" in connection with an air washer.

We are advised by H. S. Ducker, of Air and Refrigeration Corp., that "Capillary" when used in this sense is a trade mark of his firm.

(Please turn to page 4)

Pick the Right Unit for the Job!

Whatever your air moving problem, there's one unit especially suited to your needs. With this handy MEYER DATA FILE you can quickly select the unit you need and save money too. The unit consists of a letter size file Data Folder that holds engineering data sheets on Steel Plate Exhausters, Rotary Positive Blowers and Pneumatic Conveyors . . . plus equipment stock lists on new and rebuilt air moving units of every description and brand with current sales prices.

WRITE FOR YOUR FREE COPY TODAY

Wm. W. Meyer & Sons, Inc.
8262 Elmwood Ave. • Skokie, Illinois

AIR ENGINEERING

VOL. 2, NO. 2

FEBRUARY, 1960

DEDICATED TO THE SCIENCE OF AIR POLLUTION CONTROL
AIR MOVING • AIR CONDITIONING

FEATURES

Printing Press Ink Mist . . . How To Stop It 21
How N.Y. Times and other big print shops have stopped this pressroom scourge

High vs Low Velocity Air Conditioning Systems 24
Noise, cost, ease of installation in older buildings, affect choice

What's *Your* Opinion About Open, Closed and Base Bid Specs? 27
Here's what architects, engineers, contractors, owners, have to say

Simplified Guide To Selection Of Air Cleaning Equipment, Part III 30
Economics of dust collection . . . price vs capacity, disposal or salvage

Low Cost Way To Ventilate Production Welding and Buffing Set-Ups 33
Three installations described in detail, that have paid their way

DEPARTMENTS

Letters 2
Editorial 7
Newsletter 8
News of the Industry 10
Meetings 12
Air Pollution Complaint$ 13
New Appointments 14
New Literature 16
Communications Center 37
New Products 40
Advertisers Index 46
Classified Ads 46
Professional Services 46

COVER

This month's cover points up high speed printing presses, the subject of our lead article this month on ink mist control. Artwork courtesy J. W. Clement Co., printers, Buffalo, N. Y.

AIR ENGINEERING is published monthly by Business News Publishing Company, at 450 West Fort Street, Detroit 26, Michigan. Subscription prices: United States, Canada: $3.00—1 year; $4.50—2 years; $6.00—3 years. Foreign: $5.00—1 year; $8.50—2 years; $12.00—3 years. Single copies 50 cents. Application to mail at second-class postage rates is pending at Detroit, Michigan. First issue April, 1959. • CHANGE OF ADDRESS. Notify AIR ENGINEERING and your local post-office of both your old and new addresses including postal zone numbers by 12th of preceding month.

• CONTENTS COPYRIGHT 1960 by Business News Publishing Company. Reproduction of material may not be made without written permission of the publisher.

USEFUL INFORMATION
on

Activated Charcoal

for High Percentage Air Recirculation and Odor Control

Bring your files up to date with these bulletins on activated charcoal. Just clip this ad and mail it to us.

- ☐ Activated Charcoal for Air Purification
- ☐ How Activated Charcoal "Traps" Odors
- ☐ Air Purification by the Black Magic of Activated Charcoal
- ☐ Fresh Air Costs Money
- ☐ Capacity of Activated Charcoal for Specific Vapors
- ☐ Hospital Odor Control
- ☐ Weigh Odor Control Methods Carefully
- ☐ Air Purification with Activated Charcoal Filterfolds

Activated charcoal acts as a positive molecular sponge which adsorbs gases, vapors, irritants, toxic substances and smog. It enables you to engineer for high percentage air recirculation at low cost.

These and many other bulletins on all applications of activated charcoal are available to you. Give us the details of your application and we will supply specific data and samples.

We supply a complete line of activated carbons for every purpose; design and prefabricate air and liquid purification, separation and recovery systems. Barnebey-Cheney, Columbus 19, Ohio.

Barnebey Cheney

Letters

(Continued from page 2)

More Complete Coverage Than Any Other Publication

Editor:

The more thoroughly I look over your magazine, the more certain I am that it really gives me information that I want and need. There are several items, continued, unfortunately in the previous issues that I have received that I would like to complete.

As I have the September and October issues, and you are sending me the December number, I wonder if it is possible to obtain the earlier issues?

I would very much like to have these, as this appears to be the one magazine that I will keep a file of the copies. There are too many good items that are needed from time to time, to lose track of them.

It appears that your magazine covers more completely the line of effort which we do here than any other publication and consequently will be much more useful.

D. R. Whipple
Professional Engineer
Schenectady, New York

We Want Cover Artwork

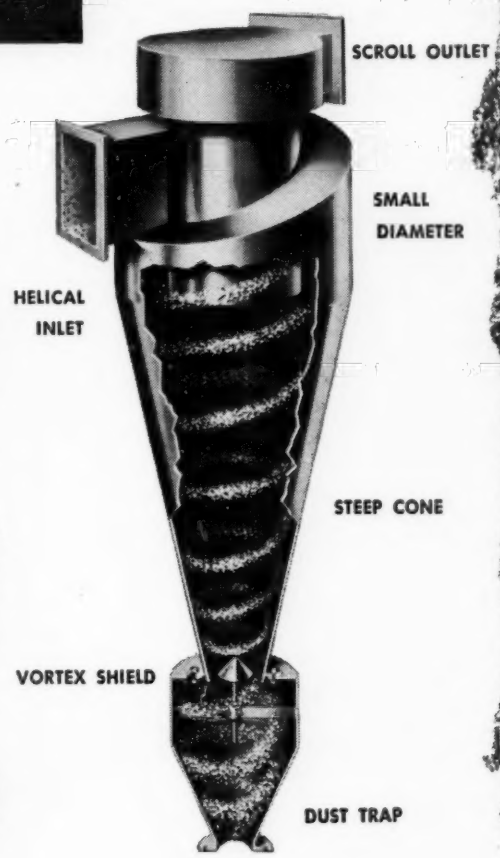
Attention all artists and photographers! We are searching for unusual and interesting drawings of an interpretive nature (see April, May, October and December covers) for front cover use in AIR ENGINEERING.

We are also interested in black and white and full color photos and transparencies, for possible use.

If you have a drawing or photo you think may be suitable, send your selection to us. We will make a prompt decision and return any unused art and photos to you promptly.

You will of course receive full credit for any cover material used.

. . . in dry dust control



proved DUCLONE® features assure

- ***HIGHER** efficiency*
- ***LONGER** service life*
- ***LOWER** operating cost*

Duclones—Ducon high efficiency cyclones—are designed and constructed for high efficiency and low gas resistance so that maximum recovery of industrial dusts is obtained at the lowest possible cost. Their sturdy construction assures long, continuous service with a minimum of maintenance.

The exceptional performance of Duclone collectors is the result of these 6 unique features:

1. Small Diameter produces high efficiency
2. Helical Roof provides a turbulence-free path for the entering gas stream
3. Steep Cone improves dust separation
4. Dust Trap assures efficient dust removal from the cone
5. Vortex Shield prevents re-entrainment of dust in upward gas vortex
6. Scroll Outlet provides a low resistance clean gas outlet

Duclones are available in single and multiple units and in special materials of construction.

For complete information send for Bulletin C-958.

DUST CONTROL SYSTEMS AND EQUIPMENT — DUCON

the name in DUst CONtrol

THE Ducon COMPANY INC.

147 EAST SECOND STREET • MINEOLA, L. I., NEW YORK

Canadian Branch:
THE DUCON COMPANY of CANADA, Ltd.,
1131 Pettit St., BURLINGTON, ONTARIO

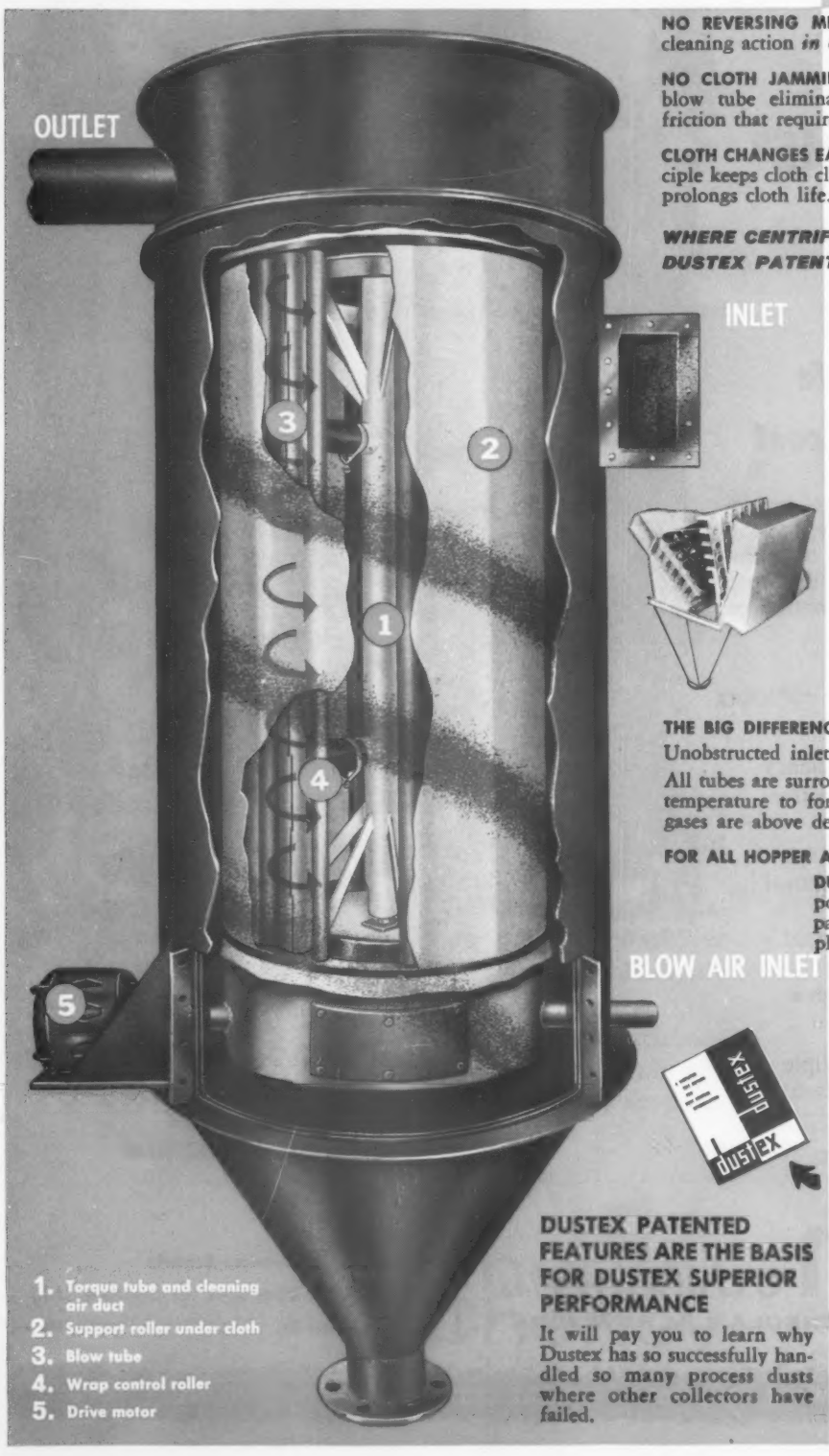
CYCLONES • CENTRIFUGAL WASH COLLECTORS • TUBULAR CLOTH FILTERS • DUST VALVES

From Dustex . . .

another revolution in dust collection . . .

DUSTEX ROTO-JET CLOTH COLLECTOR

where cloth is the RIGHT answer . . .
Dustex engineering eliminates usual cloth problems
drastically lowers operating and maintenance costs



1. Torque tube and cleaning air duct
2. Support roller under cloth
3. Blow tube
4. Wrap control roller
5. Drive motor

NO REVERSING MECHANISMS — Ingenious, simplified, continuous cleaning action *in operation.*

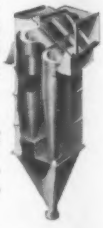
NO CLOTH JAMMING — Unique controlled wrap of cloth around blow tube eliminates cloth jamming . . . maintains constant, low friction that requires less driving torque and power.

CLOTH CHANGES EASIER . . . LESS FREQUENT — Dustex Roto-Jet principle keeps cloth cleaner during operation. Gentle, free roller action prolongs cloth life. Easy access simplifies changes when required.

WHERE CENTRIFUGAL COLLECTION IS THE RIGHT ANSWER
DUSTEX PATENTED FEATURES PAY FOR THEMSELVES

DUSTEX MINIATURE CYCLONES
D-584 with 100% efficiency at 14 microns
D-560 with 100% efficiency at 12 microns
for economical separation of dust from normal or high temperature gas or air.

MICROCLONE with 99.8% efficiency at 10 microns and smaller for ultra-high efficiency and strict sanitation . . . easily cleaned and sanitized thanks to convenient hinged top tube sheet design.



For Many Ordinary Dusts New, Low-Cost DUSTEX "1600" brings higher Dustex Performance to collectors in Lower Price Range.

THE BIG DIFFERENCE — DUSTEX EXCLUSIVE PATENTED DESIGN

Unobstructed inlet plenum avoids material buildup and plugging.

All tubes are surrounded by cleaned gases and maintained at system temperature to forestall condensation and plugging when systems gases are above dew point.

FOR ALL HOPPER AND BIN DISCHARGES (Under Negative Pressure)

DUSTEX VACUUM VALVE—No motive power required . . . No mechanical parts . . . Maintenance free . . . Bolt in place and forget it.

ON THE JOB DETERMINATION TEST YOUR BEST GUARANTEE

The Dustex Single Tube Determination Test, performed under your actual operation conditions, provides you with exact data required to select the proper Dustex Collector for your plant. No cost or obligation.

SEND FOR "A Simplified Test Method," illustrated booklet describing the Dustex Single Tube Determination Test in detail.

Details and specifications for every model available on request.

DUSTEX PATENTED FEATURES ARE THE BASIS FOR DUSTEX SUPERIOR PERFORMANCE

It will pay you to learn why Dustex has so successfully handled so many process dusts where other collectors have failed.

dustex CORP.

The company with the big name in dust collection

DUSTEX CORP. • P.O. Box 2520 • Buffalo 25, N.Y.

AIR ENGINEERING

Publisher: E. L. Henderson
Assistant Publishing Manager: P. A. Schildhammer
Editor: Eugene A. Sloane
Assistant Editor: George M. Hanning
Assistant Editor: Hugh T. Mahar
Research Manager: John A. MacLean
Advertising Manager: Alfred Chadburn
Advertising Production Manager: A. M. Barrow
Circulation Manager: R. M. Ashley
EDITORIAL ADVISORY BOARD: George F. Taubeneck • Phil B. Redeker • C. Dale Mericle
REPRESENTATIVES: NEW YORK 17—521 Fifth Ave., MUrray Hill 2-1928-9, R. M. Price, F. L. Taylor.
CHICAGO 3—134 S. LaSalle St., FRanklin 2-8643-4, M. R. Smith.
DETROIT 26—450 W. Fort St., WOodward 2-0924, Alfred Chadburn.
LOS ANGELES 43—4710 Crenshaw Blvd., AXminster 2-9501, J. A. Hannon.

EDITORIAL:

Air Engineering Finds Another Sphere Of Usefulness: It Cuts Crime Down!

WINTER, as any shopkeeper knows, is shoplifting time.

Bulky overcoats are good hiding places into which the store "booster" can slip his pilfered goods, and often carry them away undetected. Such petty thievery is big business nowadays, unfortunately.

To S. J. Curtis, security superintendent of Detroit's J. L. Hudson Co. (one of the world's largest retail stores), tossing a store "booster" into prison isn't the answer to this continuing problem.

Changes in weather, which often are much more subtly dangerous than capacious overcoats, have immense effect on shoplifting rates, he finds. So he recommends better *indoor* climate.

If the air we breathe is properly controlled, illegal inventory losses (shoplifting and theft by employes) can be cut, his studies indicate.

Moreover, thanks to employment of the relatively new science of AIR ENGINEERING, productivity of employes can be increased, he believes. Also . . . with good indoor climate . . . a sluggish customer could be revitalized at the same time. When she breathes energizing PURE air, she is sure to buy more.

AIR ENGINEERING is only one of four areas of crime prevention in which laboratory work is being pursued by our nation's leading department stores.

Others include motivational research, inquiries into the effects of blood sugar levels as morality despoilers, and experimentation with chemical "personality stabilizers" (tranquilizing pills) which might be added to mercantile lunch counter and cafeteria foodstuffs.

Another aspect of AIR ENGINEERING, as directed toward crime prevention, is ionization. Laymen might rank this subject somewhere between science fiction and television commercials. However, it is rung in seriously by Hudson's Mr. Curtis. Here's the pitch:

Molecules of air often *gain* electrons – whereupon they become known as negative ions, because electrons carry a negative electric charge. Other molecules of air change structure differently, and *lose* electrons. Thereafter they are positive ions.

These molecular alterations occur in nature quite

(Please turn to page 10)

Air Pollution In President's State of Union Message

President Eisenhower, in his State of the Union message to Congress, had this to say about metropolitan growth and associated air pollution problems: "By 1975 the metropolitan areas of the United States will occupy twice the territory they do today. The roster of urban problems with which they must cope is staggering. They involve water supply, *cleaning the air*. . . . I do not doubt that our urban and other perplexing problems can be solved in the traditional American method. In doing so we must realize that nothing is really solved and ruinous tendencies are set in motion by yielding to the deceptive bait of the 'easy' Federal tax dollar."

School Children Get Painless TB Vaccination With Ventilation

Vaccine for TB, carried by air through a ventilating system into a large room, has successfully protected children against tuberculosis.

Method of airborne vaccination through a ventilation system has been demonstrated at the University of Illinois Hospital, in Chicago. Youngsters received the immunization as they read and played, without sensation of being vaccinated.

Method of sending the vaccine through the ventilation system was perfected by Dr. Sol R. Rosenthal, director of the University's institution for TB research. Vaccine is produced at the County hospital and distributed by the Research Foundation.

Not Enough New Ideas In Air Pollution Research

Speaking at the Sanitary Engineering Division (ASCE) Conference on Economics of Pollution Abatement in Cincinnati, Mark Hollis, assistant chief of the U.S.P.H.S., said that of 280 research projects on air pollution, only 18 explored new areas and new methods of abatement. Very little is done, he stated, to define new toxic substances from new types of industrial processes.

Echoing President Eisenhower's State of the Union Message (see above) Hollis stated that by 1980, 75 percent of the projected 40 percent population growth will live in metropolitan areas. Even now, he said, what with the present shortage of hospitals, more cars, more travel, industrial growth, we must run faster to stay in the same place, so far as air pollution control is concerned.

Hollis pointed out a new area of air pollution control must also be considered, that of bacteriological sources of air pollution.

About air pollution research products, Hollis mentioned that 90 percent are on refinements of existing techniques, and that this ratio should be reversed.

He concluded that we need a major evaluation of the economic effects of air pollution on public health, and we need more highly trained engineers in air pollution.

Trane Expects New Products To Get Big Share of '60 Sales

An extensive new product program is expected to account for 25 percent of Trane sales during 1960, according to D. C. Minard, president.

New products, such as the "Absorption Cold Generator," new water chillers with hermetic compressor, unit ventilator with optional air conditioning that can be added later and a broader range of central station equipment, are expected to account for a large share of the sales total.

"Buffalo" Air Cooled Condensers Handling Propane Gas on Refrigerated Liquid Propane Storage Spheres. Photo—Courtesy of Rust Engineering Co.

WITH NEW "BUFFALO" AIR COOLED CONDENSERS

Some time ago, "Buffalo" began field testing Air Cooled condensers and Air Cooled Liquid Coolers of completely new design. But we withheld the advertising of this unique product until we could talk in terms of a **field-proven** unit. Now, we can.

"Buffalo" Air Cooled Condensers have been installed on a wide variety of applications. Reports from actual users now prove their highly efficient and economical operation. They provide complete freedom from operating difficulties. Service requirements are reduced to an absolute minimum.

These field reports prove beyond all doubt that the new "Buffalo" units have eliminated the difficulties common to most air cooled condensers.

Only "Buffalo" Air Cooled Condensers Bring You All These Advantages:

VERTICAL DISCHARGE—is not affected by wind velocity—holds compressor on line.

EASY-TO-INSTALL—shipped as factory-assembled packages. Lifting eyebolts simplify rigging.

LOW SILHOUETTE—the No. 1000 unit is only 76" high.

OPPOSED BLADE BY-PASS DAMPER CONTROL AVAILABLE—provides close modulating control not possible with parallel-blade dampers—or with "flooded coil control". Saves expensive refrigerant.

UNIT CASINGS—heavy-gauge galvanized steel construction insures durability, long life.

AMPLE CAPACITIES—Standard sizes from 7½ to 100 tons based on 120° condensing temp. 40° suction, 100° ambient. Larger sizes for special refrigerant, liquid or gas cooling applications available as factory-assembled packages.

Applications of "Buffalo" Air Cooled Condensers include air conditioning and steam condensing . . . also jacket water cooling of diesels, package compressors, gas turbines, electronic tubes, power transformers, process liquids, heat pumps.

For the utmost in reliable performance, new "Buffalo" Air Cooled Condensers are your best choice. Call your nearby "Buffalo" engineering representative for complete facts. Or write us direct.

"Buffalo"

BUFFALO FORGE COMPANY Buffalo, N. Y.

Buffalo Pumps Division, Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

NEWS of the Industry

Sanitary Engineers Find Air Pollution A Matter of Growing Concern to Them

The role of sanitary engineers in air pollution, new problems plaguing municipal waste incinerators, current and future air pollution control problems nationally, were aired at a Sanitary Engineering conference in Cincinnati last month.

The conference, sponsored by the Division of Sanitary Engineering of the American Society of Civil Engineers, the Robert A. Taft Sanitary Engineering Center and the College of Engineering, University of Cincinnati, devoted about one-third of the agenda to air pollution alone.

Both Mark Hollis, assistant chief, United States Public Health Service, and Robert Ingram, consulting engineer, stated that sanitary engineers should concern themselves with air pollution, since many of the techniques used in their field apply equally as well to air pollution.

William A. Xanten, Sup't., Division of Sanitation, Washington, D.C., pointed up the problems faced by cities in waste disposal. He stated that wastes have changed radically over the past decade, and are now far more combustible in nature. Older incinerator designs can't handle the new wastes, without air pollution and odors.

Land for waste disposal is rapidly disappearing, so the only solution appears to be design and installation of air cleaning equipment such as scrubbers on existing as well as on new incinerators.

Vernon G. MacKenzie, Assistant Chief, Research and Development, Division of Sanitary Engineering Service, U.S.P.H.S., stated that Health, Education and Welfare Secretary Flemming has asked for congressional hearings to investigate interstate problems of air pollution, and that Senator Neuberger (Ore.) has introduced a bill to permit Federal enabling legislation on air pollution, where local authorities are not legally empowered to act.

MacKenzie stated that the U.S.P.H.S. has made no studies as to how much it would cost private industry to clean itself up, in terms of air cleaning equipment.

Another Cool, Tall Tale from Texas

Houston's new 31-story First City National Bank building will have the largest air conditioning system serving a single structure in Houston, according to plans made known recently. Wallace-Straus Co., Houston contractor who will install the system, has awarded a contract for air conditioning and refrigeration equipment to Carrier Corp. for the high velocity system which will condition the building.

The modernistic skyscraper building contains 900,000 sq. ft. of floor space and occupies an entire block in downtown Houston. Its steel framework will be sheathed in aluminum and glass. A 29-story office tower arises from one-half of the two-story base, which will be occupied by stores and banking facilities.

Water chilling equipment powered by steam turbines will provide a total of 3,600 tons of cooling capacity. A record total of 3,045 individual units receiving conditioned air at high velocity from central air treatment stations will serve offices lining the exterior wall, said Charles W. Kaufman, Carrier district manager.

Editorial *(Cont.)*

Air Engineering Finds Another Sphere of Usefulness

(Continued from page 7)

frequently, and always are associated with barometric changes. When air pressure drops, and the barometer falls, the number of positive ions increases.

Subsequently, it has been shown:

(a) A high number of positive ions in the air we breathe induces irritability, headaches, and tiredness (often witnessed just before a big storm breaks). Whereupon the crime rate jumps, and shoplifters emerge in droves.

(b) Negative ionization stimulates good health, an optimistic outlook, a general sense of well being . . . and relatively few counterstealers!

Any modern retail store, wherein most of the air is controlled through air conditioning-and-heating ducts, could be negatively ionized easily.

These facts are known to scientists – and they could lead to less crime, better manners, and happier people – if ionization devices were to be installed in the air conditioning systems of stores, offices and factories.

Who knows? This application *to* air conditioning *of* a new aspect of AIR ENGINEERING not only could erase shoplifting, but reduce all sorts of criminal activities.

Let us reiterate: AIR ENGINEERING, as a youthful science, hasn't begun to explore all its possibilities and proclivities for human betterment. It has an exciting future! ▲▲

California Sets Up Standards for Maximum Level of Air Pollution

Proposed standards for a "maximum level of air pollution" and standards for motor vehicle exhaust have been established by the California State Board of Health, which has recommended that the California legislature enact these standards into law.

These standards were developed at the request of the legislature, and Gov. Pat Brown has stated that he would put the problems of air pollution on the agenda of a 1960 special state legislative session if some agreement on smog standards seems likely to be reached.

In brief, the recommendations fix 0.15 parts of oxidants per million parts of air as the highest permissible smog level. Proposed standard for motor vehicle exhausts require that the amount of hydrocarbon be reduced 80 percent and the amount of carbon monoxide 60 percent.

Commenting on the standard for motor vehicle exhaust emissions, the Air Pollution Foundation states that the standard set for hydrocarbon emissions—275 parts per million by volume (0.165 percent carbon atoms)—"will require different 'percentage reductions' on different vehicles. This will mean perhaps 80 percent on some, considerably less on others, but a higher percentage on still others. The point is, engineers now have a clear and precise target, about which there can be no misinterpretation."

The foundation also issued a tabular "brief" of the standards for ambient air quality. The bases upon which standards are set are indicated by items enclosed with parentheses:

* * *

POLLUTANT	"ADVERSE" LEVEL Level at which there will be sensory irritation, vegetation, or similar effects.	"SERIOUS" LEVEL Level at which there will be alteration of bodily function or which is likely to lead to chronic disease.	"EMERGENCY" LEVEL Level at which it is likely that acute sickness or death in sensitive groups of persons will occur.
Oxidant Ozone Nitrogen Dioxide Hydrocarbons Photochemical Aerosols	"Oxidant Index" 0.15 ppm for 1 hr by the potassium iodide method (eye irritation, plant damage, and visibility reduction)	no standard set for this level.	no standard set for this level.
Sulfur Dioxide	1 ppm for 1 hr or 0.3 ppm for 8 hrs (plant damage)	5 ppm for 1 hr (bronchoconstriction in human subjects)	10 ppm for 1 hr (severe distress in human subjects)
Carbon Monoxide	no standard set for this level.	30 ppm for 8 hrs or 120 ppm for 1 hr (interference with oxygen transport by blood)	no standard set for this level.
Particulates	Sufficient to reduce visibility to less than 3 miles when relative humidity is less than 70 percent.	no standard set for this level.	no standard set for this level.

New Dallas Bazaar To Be Air Conditioned

The $6¼ million Bazaar Northwest shopping center in Dallas, on which construction is scheduled to begin this Summer, will be completely air conditioned and constructed on a central mall.

Space for 35 tenants will be provided. All stores will open on the all-weather air conditioned mall. There will be no exterior exposures for the stores. The mall will include two wide plazas.

"The effect of adverse weather, definitely a contributing influence on business volume of shopping centers, has been overcome in Bazaar Northwest by using the covered, air conditioned streets, or malls, between stores," it was pointed out by the planners.

AGA Moves Deeper Into Air Conditioning

Several moves to put the gas industry more firmly into the air conditioning field were reported recently by American Gas Association.

Robertshaw-Fulton Co. has been given an exclusive license to manufacture and market a new free piston refrigeration compressor for air conditioning applications. The device was described as "a combination of a remarkably simple and efficient internal combustion engine and refrigerant compressor in a single unit having only one moving part." Robertshaw will manufacture and market the free piston engine-compressor unit only for those who may seek to make use of it in conventional systems.

Research and development is continuing, the A.G.A. said, on the Swiss absorption system being developed by the A. O. Smith Corp., on an air-cooled absorption air conditioning system, a vertical inline engine compressor, new absorption system refrigerants, and new cooling methods.

Researchers at A.G.A.'s Cleveland Laboratories developed a demonstration model of a small, self-contained, all-gas forced air furnace which generates the electricity to operate its own warm air circulating fan. Employing thermo-electric principles, the furnace uses thermocouples which convert gas heat into electricity.

NEWS of the Industry . . .

(Continued from preceding page)

Air Conditioned Schools Can Cost Less to Build

Construction plans for two schools, one in Syracuse, N. Y., and the other in Abilene, Texas, were cited as examples of how educational plants designed around air conditioning may cost no more and may be even less expensive than those with conventional heating and ventilating systems.

According to figures made public by Carrier Corp., which will air condition both schools, the F. Ware Clary Junior High School in Syracuse will cost $16 a square foot.

The Clary School design calls for two halves of a simple rectangular shape connected by a covered passageway. One half will contain 31 classrooms surrounded by an air conditioned corridor to minimize heating and cooling losses by transmission through outside walls.

Dr. Paul A. Miller, Syracuse superintendent of schools, said that with the cost of air conditioning included, a net saving of $54,500 will be achieved by building compactly instead of erecting a school with long classroom wings.

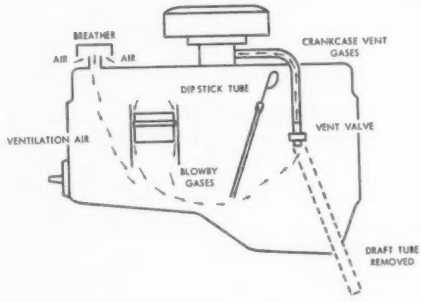
The Abilene School is expected to cost $11 a square foot and will consists of nine separate buildings, seven of which will be air conditioned, and the system will be so designed as to divert cooling to the boys' gymnasium, not regularly air conditioned, for evening events.

Organize New Firm To Market New Dust, Dirt Control System

Formation of CRS Industries, Philadelphia, has been announced by William C. McMichael, Michael H. Pelosi, Jr., and Ben S. Altshuler.

The firm will market a new dirt and dust control system made by the American Statronic Corp., of New York.

The Statronic system is an electronic method for particulate bombardment and negative ionization of particles in an air stream.



Californians Dispute SAE Findings on Crankcase Emissions

Crankcase hydrocarbon emissions amount to 40 percent of total engine hydrocarbon emissions, exclusive of carburetor vent losses, making such emissions a major portion of the automobile's contribution to air pollution, a team of General Motors Corp. researchers reported to the Society of Automotive Engineers at its recent meeting in Detroit.

While hailing the report as an excellent first step in a new direction to controlling photochemical smog as found in Los Angeles, California air pollution control officials disagreed with the conclusion, as it would apply in California.

They contend that in cars of poor mechanical condition, such as abound in California, crankcase emissions would account for only 10 to 20 percent of total emission. Control of crankcase emissions will have little if any effect on the need for an afterburner, W. L. Faith, of the Air Pollution Control Association, declared.

However, crankcase emissions can be controlled cheaply and simply by crankcase breather control device that taps the draft tube and carries blowby gas from the crankcase to a point below the carburetor in the engine intake system. (See diagram).

AIR ENGINEERING learned at the SAE meeting that the cost of such a device would range anywhere from 99 cents to $25, depending on the number of parts involved and difficulty of installation.

Glen Fitzgerald of A.C. Spark Plug Div., General Motors Corp., said his company has already prepared 45 different venting kits, but still has a long way to go to cover all auto models produced in the last 10 years.

All new 1961 American made cars produced for the California market will be equipped with a crankcase ventilating device, the Automobile Manufacturers Association has promised.

APCA Plans for 1962

Plans are being made to hold the 1962 convention of the Air Pollution Control Association in Chicago.

Meetings, Courses, Expositions

U. S. Public Health Service course in "Microscopic Analysis of Atmospheric Particulates," *Robert A. Taft Sanitary Engineering Center, Cincinnati, Feb. 15-26.*

Ninth annual Industrial Ventilation Conference, *Kellogg Center, Michigan State University, East Lansing, Mich., Feb. 15-18.*

Air Pollution Control League of Greater Cincinnati 54th annual meeting, *Auditorium, Cincinnati Public Library, Cincinnati, Feb. 17.*

American Institute of Industrial Engineers, Detroit chapter's third annual winter conference. Theme: "Practical Approach to Industrial Engineering." *Statler Hilton hotel, Detroit, Feb. 18-19.*

23rd National Oil Heat & Air Conditioning Exposition sponsored by Oil Heat Institute of America, *Coliseum, New York City, April 3-7.*

Oil Heat Institute of America, 38th annual convention, *Park-Sheraton hotel, New York City, April 3-7.*

U. S. Public Health Service course on "Atmospheric and Source Sampling," *Robert A. Taft Sanitary Engineering Center, Cincinnati, April 4-15.*

Building Research Institute Spring conference, *Statler-Hilton hotel, New York City, April 5-7.*

Instrument Society of America, 3rd national chemical and petroleum instrumentation symposium, *Rochester, N. Y., April 5-7.*

American Chemical Society, 137th national meeting, *Cleveland, April 5-14.*

Pollution Complaint$

Hamilton, Ont., Can.—At The Steel Company of Canada, sintering plant emissions, successfully trapped by control equipment.

• • •

Chicago—Two fatalities and scores of illnesses from burning old auto batteries has led to arrest of Irwin Salk, president, Burco Battery Co.

• • •

Dundee, Mich.—Dundee Cement Co. has allocated $1,000,000 for dust control devices "to assure maximum cleanliness inside and outside the plant, according to Roblee B. Martin, general manager. A set of electrostatic precipitators will be installed.

• • •

Bartow, Fla. — Injunction suit filed against Virginia-Carolina Chemical Corp. in circuit court by Mr. and Mrs. T. M. Mathers. Suit, claimed to set a precedent, is based on a charge that the company is causing air pollution due to "discharge of large amounts of dust, gases and fumes, the odor of which is irritating and the nature thereof burning when mixed with the surrounding air and breathed by people." Suit also charged that the "noxious refuse is not only irritating to plaintiffs physically and mentally . . . but it has killed or stunted the growth of all vegetation which plaintiffs have sought to grow around their home."

Memphis — Virginia - Carolina Chemical Co. has spent over $60,000 in air cleaning equipment to remove hydrogen fluoride from plant emissions, and for trapping fertilizer dust from mixing processes. V-C hopes to pay for equipment from savings in trapped dust.

• • •

Olympia, Wash.—A $10,800 jury award to Mr. and Mrs. R. N. Riblet was upheld by the State Supreme Court. Action was brought by the couple against the Ideal Cement Co., based on cement dust deposited on their property.

Chicago Air Control Gets More Muscle

Chicago will have new "muscle" in its air pollution control efforts starting in 1960, Thomas H. Carey, director of the city's air pollution control department has pointed out.

"With the addition of an analytical laboratory and the formation of an air pollution control committee, a technical advisory board, and an appeals board to administer the new air pollution control ordinance, the department can put new muscle into its work," Carey said.

In December Mayor Daley appointed nine men to the air pollution control committee—a board of research—including representatives of the steel, transportation, and chemical industries. Many of the programs to be instituted by the committee will demand cooperation of the industry, Carey pointed out.

More than $500,000 was earmarked in the city budget for the department. This is an increase of about $40,000 more than last year's and a boost of about $200,000 over that of 1957. Some 20 smoke inspectors and a like number of combustion engineers are employed.

The department has jurisdiction only within the city limits.

Goodbye to Plant Fumes!

• NEW FIBER GLASS FUME EXHAUSTER IS EASILY INSTALLED!

A simple, self-contained unit that is easily installed. Requires a minimum of space and maintenance. Shipped ready to connect to ductwork, water supply, and drain.

Hard to handle, corrosive fumes are *easily dissipated* by this dependable Master Lip-type FUME EXHAUSTER FIBERGLASS UNIT. Capacities from 1500 to 12000 C.F.M. Maximum air movement plus quiet, vibration-free operation, long life, and low operating cost. **Carbon steel and plastisol lined Fume Exhausters, also, are available.**

MASTER FAN CORP.

1323 CHANNING STREET LOS ANGELES 21, CALIF. MAdison 2-1037

Serving Western Industry for over 40 years.

New Appointments

York Div. of Borg-Warner Corp. has recently named:

Landmesser

W. E. Landmesser as general sales manager for packaged products. He was previously manager of distribution.

Albert J. Krause as merchandise manager of commercial air conditioning. Formerly in the product design engineering department, he will be responsible for sales planning and application of packaged commercial air conditioning products.

A. J. Krause

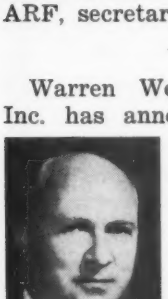
F. C. Wood as manager of air conditioning sales in the engineered machinery sales department. He was formerly midwestern manager.

J. V. Clippinger as manager of parts and accessory sales for the engineered machinery department. He has been associated with the York Parts Depot program.

Dr. Haldon A. Leedy, director of Armour Research Foundation of Illinois Institute of Technology, has been reelected president of the Midwest Air Pollution Prevention Association, Inc.

Other officers reelected were **Lewis A. Evans,** Chicago & Indiana Railroad Co., first vice president; **Dan A. Sullivan,** consultant at Armour Research Foundation, second vice president; **Douglas R. Fuller,** Northern Trust Co., treasurer; and **Dr. Christopher E. Barthel, Jr.,** assistant director of ARF, secretary.

Warren Webster & Company, Inc. has announced the appointment of **Robert W. Butler** as vice president of operations.



R. W. Butler

Butler has served in executive capacities with such firms as Crown Cork and Seal Co., and Scovill Mfg. Co. He was at one time senior partner of a Philadelphia area business consulting management firm.

R. A. Pierce

Lennox Industries, Inc. announces the appointments of **Robert A. Pierce** as general manager and **F. Gordon Lenzi** as sales manager of its Lennox-Syracuse Div.

Pierce, formerly sales manager, fills a vacancy created by the death of **H. G. Krayenhof,** former general manager. Lenzi has been New England division manager since 1951.

F. G. Lenzi

Connor Engineering Corp. has appointed Airfoil Products Corp., Chicago, as its sales representative in northern Illinois, northwestern Indiana, and Wisconsin. Airfoil's **Verne Launspach** and **Bob O'Connor** will handle the Connor line.

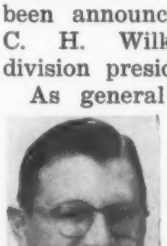
Appointment of **Vincent J. Castrop** as director of the General Motors Industrial Hygiene Department was announced by Louis G. Seaton, GM vice president in charge of personnel staff.

Castrop succeeds **Frank A. Patty,** retired. Castrop has been assistant director of the Industrial Hygiene Department since 1947. Currently he is president of the Michigan Industrial Hygiene Society.

Appointment of **H. E. Rossell, Jr.** as general sales manager and **R. J. Berkshire** as general marketing manager of the Air Conditioning Div., American-Standard, has been announced by C. H. Wilkinson, division president.

H. Rossell, Jr.

As general sales manager, Rossell will have charge of all field sales activities. Berkshire will have charge of marketing plans and services, market research, product development, advertising, sales promotion, and dealer training.



R. Berkshire

Minneapolis - Honeywell Regulator Co. has appointed:

Douglas K. Ridley to the new post of contract sales manager for automatic control equipment produced by Brown Instruments Div. and other industrial product group units. He served as regional sales manager in Dallas and Chicago prior to this assignment.

D. K. Ridley

Dean B. Randall as director of advertising for Minneapolis-based divisions. He will coordinate all advertising activities and continue to be responsible for industrial control, semiconductor, home product, military product, and corporate advertising.

D. B. Randall

Robert Ruff as advertising and sales promotion manager for the commercial and international divisions. For the past 10 years he has been advertising manager of McCulloch Corp.'s marine products division.

Robert Ruff

William T. Ingram, consulting engineer in New York City, has opened a West Coast office at 90 Panoramic Way, Walnut Creek, Calif., with **Fred R. Ingram** as Associate in charge of that office. Ingram brings to the staff a specialist's experience in industrial hygiene and air pollution control.

Carl L. Tucker has been appointed chief engineer of Remington Corp. He joined the company last Feb. 1 as project engineer specializing on Remington's "Incremental" type of commercial air conditioning equipment. Prior to joining Remington, he was project engineer in the air conditioning department of Emerson Radio & Television Corp.

C. L. Tucker

HOW WESTERN PRECIPITATION'S UNIQUE "KNOW-HOW" BENEFITS YOU!

The science of dust, fume and fly ash recovery is a highly technical one. Moreover, the fact that there are a number of basic methods for separating suspensions from industrial gas streams – each with certain advantages and disadvantages – further complicates the basic problem.

Even two different plants cleaning the same type of gas may find that such variables as capital investment policies, maintenance and labor schedules, and other similar management functions may make one type of equipment the logical choice for one plant – a basically different type of equipment the best solution for the other.

That's why Western Precipitation's position in the gas cleaning field is so unique. It is the *only* organization that designs, engineers and installs *all* the basic types of gas-cleaning equipment. It is completely unbiased in its viewpoint, and is able to show you exactly how the overall costs, the collection efficiencies and the operating requirements will vary for each installation – with each type of collecting equipment that may be applicable.

Such an unbiased evaluation is invaluable in assuring optimum returns from your gas-cleaning dollar. Best of all, this unique "know-how" costs you nothing. It is a basic part of Western Precipitation's service to industry throughout the United States, Canada and the Free World.

Our nearest representative will gladly place this unique fund of experience at your service. Why not call him today?

Only WP has all 6

1. COTTRELL Electrical Precipitators
2. MULTICLONE Mechanical Collectors
3. CMP Combination Units
4. DUALAIRE Jet-Cleaned Filters
5. THERM-O-FLEX Hi-Temp Filters
6. TURBULAIRE-DOYLE Scrubbers

Also: HOLO-FLITE Processors
HI-TURBIANT Heaters

G-130

WESTERN
PRECIPITATION
CORPORATION

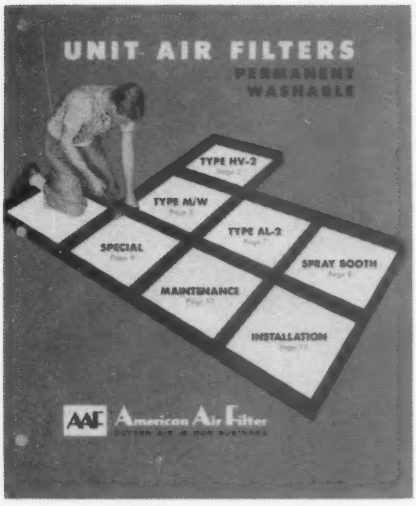
Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries

LOS ANGELES 54 • NEW YORK 17 • CHICAGO 2 • PITTSBURGH 22 • ATLANTA 5 • SAN FRANCISCO 4

Representatives in all principal cities

Precipitation Company of Canada Ltd., 8285 Mountain Sights Avenue, Montreal 9

New Literature



Unit Air Filters

Composite product bulletin describing the construction and application of permanent washable unit air filters, has been released by American Air Filter Co., Inc. Bulletin No. 207 illustrates and explains the construction and advantages of the Type HV-2, high capacity, low resistance unit; Type M/W, heavy-duty metal filter; Type AL-2, aluminum filter; Type S, Spray Booth filter; and special air filters.

Source: *American Air Filter Co., Inc., Dept. PD-AE, 215 Central Ave., Louisville 8, Ky.*

Revised School Heating Report

Prepared by the Electric Space Heating and Air Conditioning Committee of the Edison Electric Institute, a report titled "Modern Schools Are Heated Electrically," lists 212 schools in 29 states which have installed electric heating facilities. Reports on three Canadian schools are included in the booklet. Data include the number of classrooms and other rooms, connected heating load, type of heating equipment, degree days, and date of installation.

EEI Publication No. 59-214 is priced at $1 to EEI members, $1.25 to non-members.

Source: *Sales Div., Edison Electric Institute, Dept. AE, 750 Third Ave., New York 17, N. Y.*

Short Form Simplifies Selection of Silencer Units

New short form enables contractors and engineers quickly and accurately to determine type and number of silencing units required for any air handling system.

Form consists of binder and pad of 25 reproducible work sheets. In working out noise reduction requirements step-by-step on form, exact size, model, and number of packaged unit silencers required can be determined.

Price: $1 per copy.

Source: *Air Conditioning Dept., Industrial Acoustics Co., Dept. AE, 341 Jackson Ave., New York 54, N. Y.*

Drayer-Hanson Catalog

1960 Catalog devoted solely to air conditioning products introduces new line of high pressure air handling units. Other products described include evaporative condensers, room air conditioners, air handlers, air-cooled condensers, and others.

Source: *Drayer-Hanson Div., National-U.S. Radiator Corp., Dept. AE, Catalog Publications Section, 3301 Medford St., Los Angeles 63, Calif.*

1960 Directory of Certified Unitary Air Conditioners

First 1960 Directory of Certified Unitary Air Conditioners has been published. It gives certified capacity ratings in Btuh for 1,995 models of air conditioners made by about 50 participating manufacturers.

Source: *Air-Conditioning and Refrigeration Institute, Dept. AE, 1346 Connecticut Ave. N.W., Washington 6, D. C.*

Use Communications Center, page 37, for requesting more information about articles, advertised products, literature, etc.

Circular Diffusers

A 16-page catalog describes Silentair series of circular diffusers and accessories. Booklet features product information, specifications, and performance charts organized for easy reference.

Source: *General Air Products, Dept. AE, 14 Factory St., Cedar Grove, N. J.*

Humidifier Bulletin

A new bulletin describing the Kauffman Type "A" humidifier has been published recently. Bulletin 150 gives features of the reinforced plastic humidifier and lists possible applications.

Source: *Kauffman Air Conditioning Co., Dept. AE, 4336 W. Pine Blvd., St. Louis, Mo.*

Compressed Air Fundamentals

"Compressed Air Fundamentals" basically describes compressed air, how it is compressed, single and two-stage compressors, piston displacement, actual delivery, unloading of compressors, regulation and types of control used. Other material included is information on compressor oils, pipe sizes, wire sizes, and terminology and definitions related to air compression.

Source: *Ingersoll-Rand Co., Dept. AE, 11 Broadway, New York City.*

INK MIST *and How To Control It*

Wherever high speed printing presses are operated there's likely to be an ink mist problem that gunks up presses, creates a toxic and explosive hazard in press rooms. Here's how modern printing shops and large newspapers have solved this problem through modern ventilation and filtration techniques.

by V. N. Fedoroff
Senior Application Engineer
Carrier Corp.

INK MIST, BLACK SCOURGE of the press room, is a product of modern technology that has its origin in the invention of the web-fed printing press in 1890.

A web press prints on a continuous roll of paper (known as the web), cuts it to page size, then collates and folds it. Originally developed for a low grade of black-and-white printing, such as newspapers and telephone directories, recent improvements in the press and paper have led to its use in printing quality color magazines.

The web press brought speed to the printing industry, but with speed came the critical problem of ink mist.

Press room mist is composed of almost invisible droplets of ink, which are slung from press cylinders and inking rollers by centrifugal force, freeing them to float around the room and stick to walls, ceilings, equipment and men. Adding to the problem by joining forces with the mist is paper "fly" – specks of paper liberated when the web hits the slicing knife.

Mist and fly form a black, sticky fog that, under certain conditions, can decrease visibility and contaminate air in the press room as well as in mailing rooms and other adjacent areas. Together, they add immeasurably to housekeeping chores and equipment maintenance (particularly automatic controls), and form a real fire hazard because of the inflammable nature of printing ink (composed of kerosene, resin, carbon and linseed oil).

The current trend toward year-round air conditioning of newspaper plants points up another need for control of ink mist – to prevent the gummy substance from clogging air handling apparatus, coils, etc.

The amount of mist increases with press speed, becoming a vital factor at speeds producing 45,000 to 60,000 newspapers per hour. At the latter figure, about top speed for a single web press, paper is traveling through the machine at about 2,000 fpm and printing cylinders are spinning at about 500 rpm, fast enough to sling off great quantities of mist.

A piece of white paper exposed to the mist when presses are running will turn light gray in two hours. Some plants without effective control make it a practice to wash down the press room walls after each day's run.

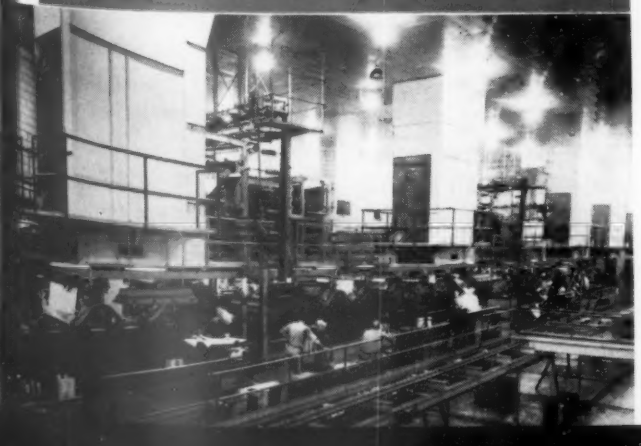
The Times-Mirror Press, a job printing plant in Los Angeles, found nearly 3 in. of sediment in the water tank of the dehumidifier after a week's run of telephone directories. This "gunk" had the appearance of warm asphalt and was very hard to remove.

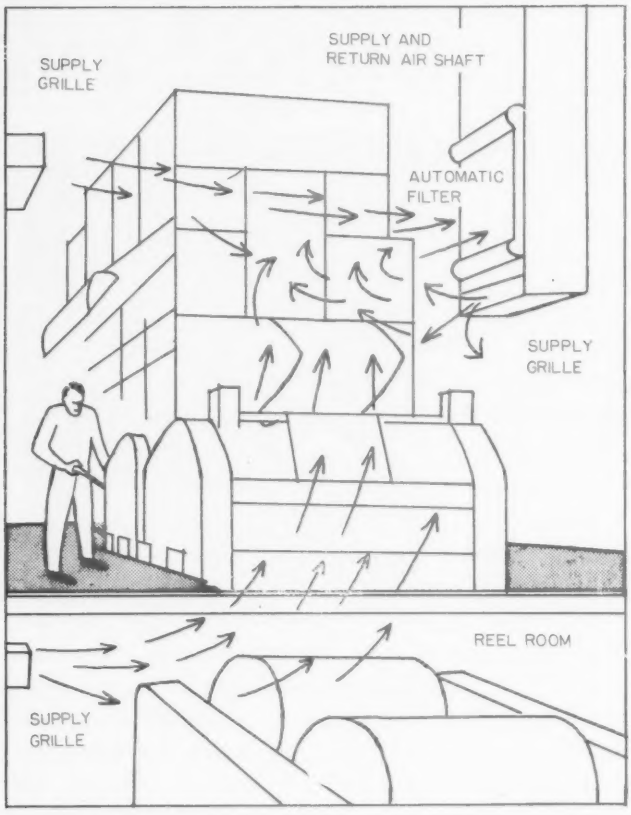
Because of this, owners of the Los Angeles Times newspaper (who also own the Times-Mirror Press) decided to use all outside air for its press room when a new newspaper plant was built. The entire building is air conditioned, reducing the heat load from machines and improving printing techniques through control of humidity.

The use of all outside (once-through) air with

(Please turn to following page)

Below: *Five huge filter assemblies suspended from the ceiling keep the press room at the Miami (Fla.) Daily News as bright as new despite 21 high-speed presses.*





An artist's conception illustrates air movement through the Miami Daily News press units . . . movement that helps direct ink mist into the low hanging filter unit at the right.

(Continued from preceding page)

adequate exhaust is one of the two basic ways to handle the ink mist problem. The other method is to use part return air. The latter is most common because of the lower refrigeration requirement.

Regardless of which method is used, it must be accompanied by an effective filtration system. If all outside air is used, filters will trap most of the ink mist before it is exhausted and will prevent soiling surrounding buildings. If part return air is used, adequate filtration will keep return air ducts, air conditioning apparatus and supply ducts ink-free.

New York Times Installation

Steel wool, glass wool and other types of non-automatic (throwaway) filters may be used. The New York Times, for example, employs two-inch-thick fiberglass filters on each return air intake, but changes them every four days to minimize fire hazard caused by collection of ink mist.

These filters are the most practical and economical solution for handling ink mist problems in smaller job shops. Located inside of self-contained air conditioning equipment, they should be frequently checked to maintain optimum performance.

The Eureka Specialty Printing Company of Scranton, Pa., has successfully used a bank of two two-inch-thick filters installed in the return of a large fan-coil unit. When the first layer is soaked with ink, it is thrown away and another installed to maintain the four-inch depth. Savings in maintenance and housekeeping more than pay for the filters used. And any filtration system is more desirable than cleaning clogged coils.

Atlanta Journal-Constitution

One of the outstanding mist filtration jobs in the country is being done in Atlanta in the 11-year-old press room of the Journal-Constitution. Here 32 high-speed press units turn out two large circulation newspapers and operate almost continuously in a room 150 ft. long, 50 ft. wide and 30 ft. high.

Four filter units, each composed of two automatic dry-type filters with an individual capacity of 5,000 cfm, are spaced along and over each row of presses near the ceiling. Two additional units are located near a wall. Filtration is accomplished by continuous sheets of two-ply paper moving down the face of the air cleaning devices. Each paper roll lasts four to five weeks.

Three exhaust fans draw room air through the filter media and into a common exhaust duct and air shaft, discharging at the fourth floor roof level. Since only filtered air, and not air laden with ink particles, passes through the exhaust ducts, fire hazard and maintenance are reduced.

Supply air is introduced at the three operating levels of the presses, upper deck, lower deck and reel room. The reel room is below press level and contains the reels of paper being fed to the presses.

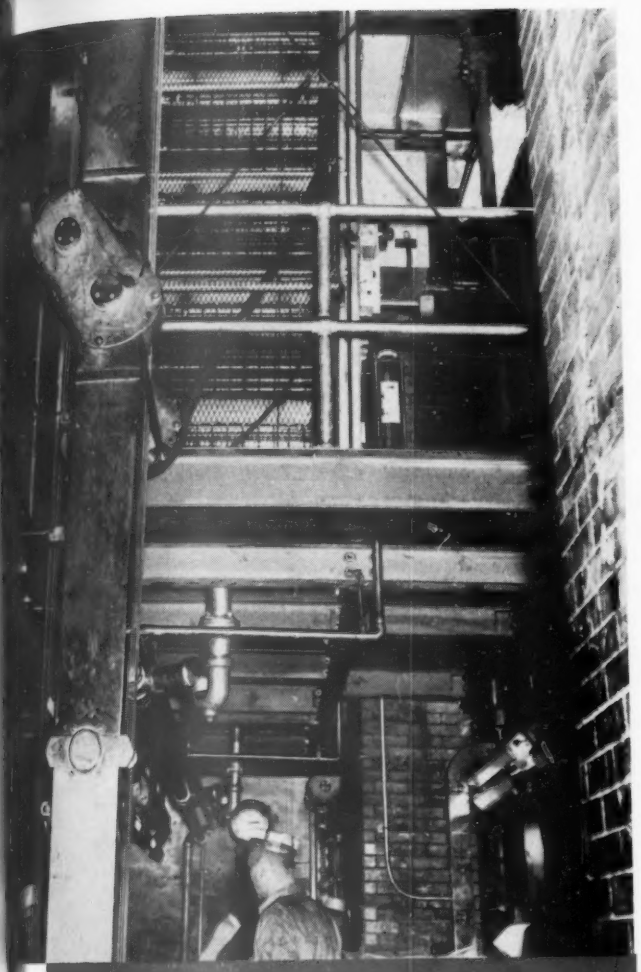
By admitting cool fresh air at the lowest level and exhausting it at the highest point immediately above the presses, supply air moves up with the thermal currents caused by heat from the presses and tends to move ink mist upward into the filters as it is thrown off the cylinders.

Air is supplied to press and reel rooms at the rate of 98,000 cfm and exhausted at the rate of 102,000 cfm, accomplishing an air change every three and one-quarter minutes. A greater exhaust quantity is advisable to maintain a negative pressure within the space to avoid ink leakage through doors and openings into other areas.

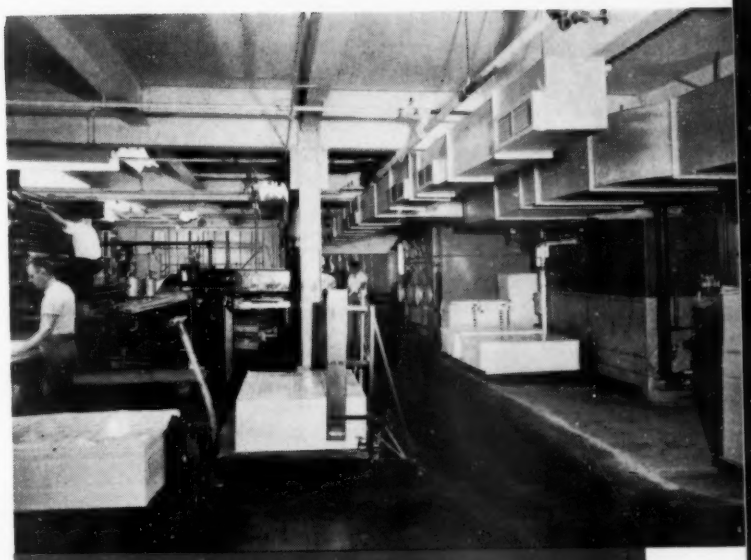
Washington (D.C.) Evening Star

A modification of this system is employed in the new, completely air conditioned Washington (D.C.) Evening Star. The reel room and the mail room (directly above the press room) are under positive pressure. The press room itself is under negative pressure.

Conditioned air is supplied at floor level adjacent to each press. Additional air rises through the units from the reel room. Large exhaust openings spaced 25 ft. apart are located in the ceiling directly above the presses. Each opening handles 4,000 cfm. Exhaust



Above: *At Pittsburgh Press, an electrostatic precipitator traps ink mist. Ink-saturated air enters unit through double ended filters and clean, pure air is discharged at top. Drain at base of unit carries off diluted ink mist solution during automatic washing cycle. 80 percent or more air can be recirculated. Units handle total of 24,000 cfm. Photo courtesy Trion, Inc.*



Above: *A bank of two-inch filters in return of fan-coil unit at right helps keep the Eureka Specialty Printing Company of Scranton, Pa., free of ink mist.*

Above: *Air conditioning, using all outside air, is a feature of the block-long press room at the Los Angeles Times. The adequate exhaust of once-through air prevents ink mist from recirculating back into the room.*

air passes through automatic filters of the type previously described.

Still another variation is in use at the new Miami (Fla.) Daily News plant, where three presses of seven units each are capable of producing 135,000 56-page newspapers every hour. With press cylinders revolving at 375 rpm, the gleaming press room would be black with ink in a matter of weeks without adequate protection.

The safeguards are five filter assemblies, suspended from the ceiling in large, hood-type enclosures for trapping airborne mist. Spaced along the single row of presses in the center of the vast room, they are ready to serve future expansion of press facilities.

With supply air flowing up around the presses and caught by the low-hanging filter units, Daily News officials estimate that more than 85 per cent of ink mist and paper fly is captured.

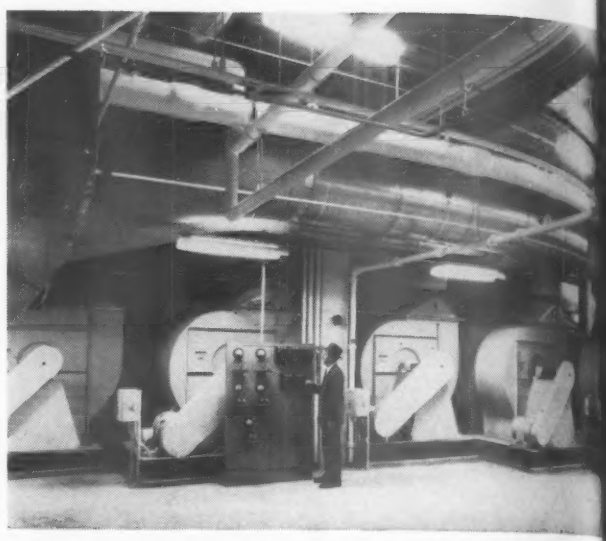
At the Pittsburgh Press, a 50-50 system, half electrostatic filter, half semi-automatic dry type filter, was installed about two years ago in the 33-year-old press room. According to J. Harold Mintun, production manager, "for the first time we were able to recirculate press room air."

The press room is not air conditioned as such, but supplied with ventilation air. Air laden with ink mist had been exhausted to atmosphere, and had created an air pollution problem in the neighborhood.

(Please turn to page 45)

LOW *vs* HIGH *Velocity Air Distribution*

by C. O. Wood
Manager, Engineering Laboratory
Westinghouse Electric Corp.
Sturtevant Div.



In Denver's new First National Bank 28-story skyscraper, a total of 691,000 cfm of air is moved. Airfoil fans operate up to 7½ in. sea level pressure in a high velocity system.

Both have their uses and drawbacks. Here are some tips on where high velocity systems can be used--and where they can't.

HIGH VELOCITY AIR DISTRIBUTION has definite advantages when used in the right application. However, since high air velocity creates high pressure loss and noise, the design method must tend toward offsetting these disadvantages.

One such method is the use of less air volume with a larger temperature differential. An efficient diffuser is required at the outlet to prevent drafts due to the larger temperature difference.

Another method provides only a small amount of fresh air with additional cooling or heating supplied by individual finned coils in each room.

In either case the net result is a saving in space. This is the principal reason for the use of high velocity air distribution. This advantage is most pronounced in multi-story buildings. Overall height of the building can often be reduced due to the saving in air conditioning duct space.

Similarly, when older buildings are modernized, the smaller space requirements can be of tremendous advantage, often to the extent that duct work can be installed while the building is still occupied. The space savings in these cases will often pay for the additional cost of the system.

Small duct diameters permit passing through holes in beams without the need for additional expensive construction. Smaller riser area results in more floor space for other uses.

Another definite advantage of high velocity air distribution is the case of individual room control. This is very important in hotels or office buildings where individual occupants desire different air conditions.

Control is achieved by use of an attenuator box containing one or more valves and suitable baffles and insulation. This box serves a dual function of controlling air flow and absorbing noise created by throttling high velocity air.

Zone control can be very satisfactorily obtained with high velocity.

Savings in metal and insulation for ducts can be considerable in a high velocity system. Ease of installation of smaller ducts will also produce a saving in labor. These savings are somewhat offset, however, by additional care required in sealing of ducts.

Pulsations in the system due to wind gusts are minimized in a high velocity system because pressure fluctuations are a small part of fan capacity.

There are many jobs where the space saving advantage of high velocity will also pay no dividends in providing additional rental space or reducing building costs. Also there may be little need for precise or individual temperature control.

On these jobs, then, there would be no real benefits to offset the added cost of high velocity and conventional low velocity system will likely prove the best investment.

Low velocity in ducts produces less pressure drop and less noise so that substantial savings can usually be made in initial fan cost, lower fan horsepower, and in noise reduction accessories.

The following table indicates the usual velocity

ranges for both high and low velocity systems. These limits are not rigid and there will often be good reasons for designing outside these suggested ranges.

A critical noise requirement will indicate a lower velocity should be used. An exhaust system carrying heavy dirt or solids would require higher velocities to prevent plugging.

TABLE 1

Designation	Velocity Range fpm Low Velocity Systems	High Velocity Systems
Outside air intakes*	300-1500	300-1500
Filters*	300-1000	300-1000
Heating Coils*	300-1000	300-1000
Cooling Coils*	300-700	300-700
Air Washers	500-750	500-750
Fan Outlets	1300-2800	1300-2800
Main Ducts	1000-2400	2500-4500
Branch Ducts	600-1600	2000-4000

*These velocities are based on total face area, not the net free area.

When designing for high velocity more attention must be given to details in order that a successful system will result. Advantageous use of small ducts is penalized by increased friction and dynamic losses, higher fan horsepower, and increased noise sources. Therefore, these items must be scrutinized carefully to minimize the penalty.

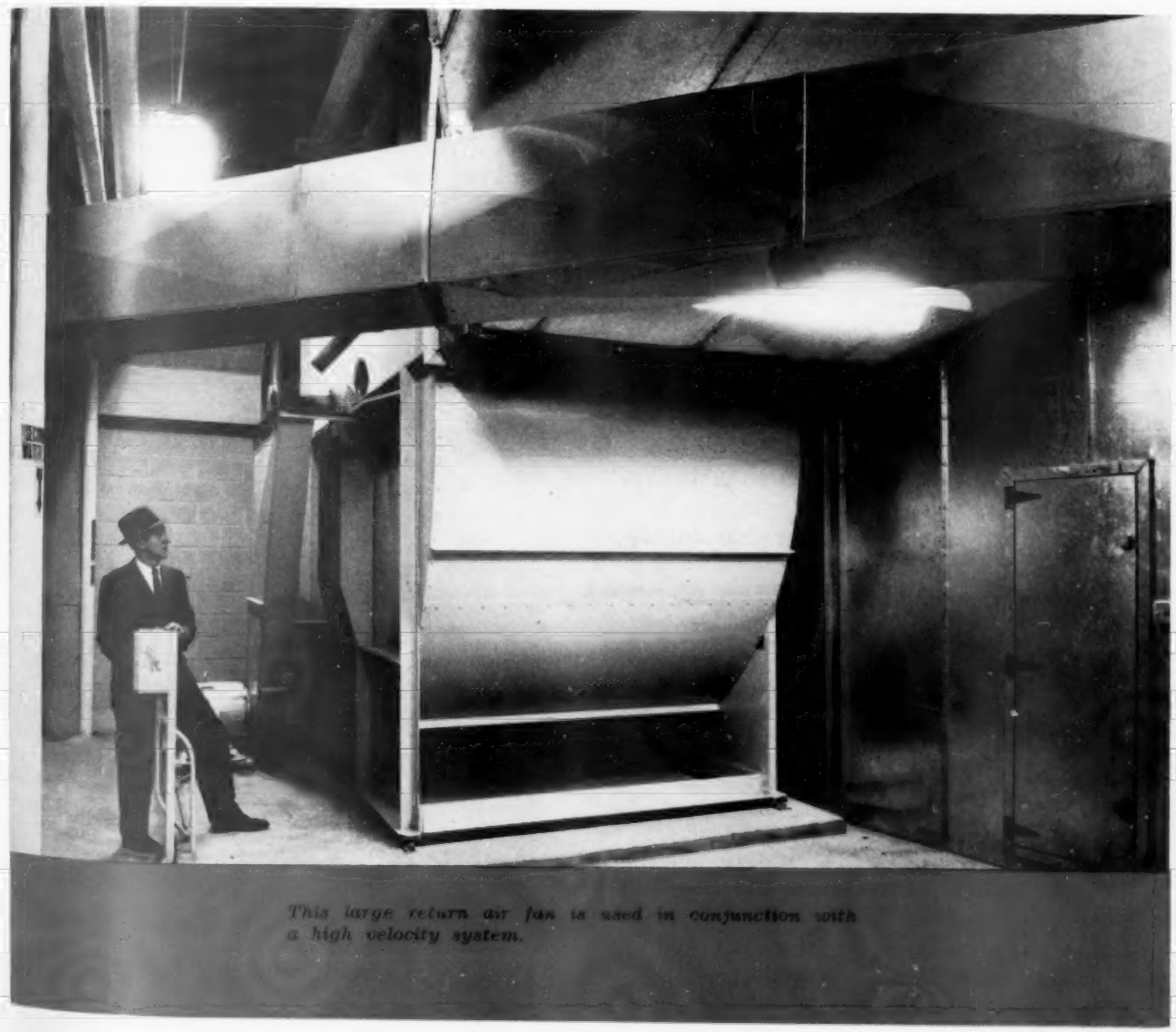
Close attention should be given to duct fitting design and to static pressure loss and regain at changes in duct section. This will help to lower the fan horsepower and static pressure.

If fan total pressure rise is held to a 6¾ in. water gauge or less, a Class II fan can be used with important savings. Also lower static pressure will result in lower fan noise and lower horsepower.

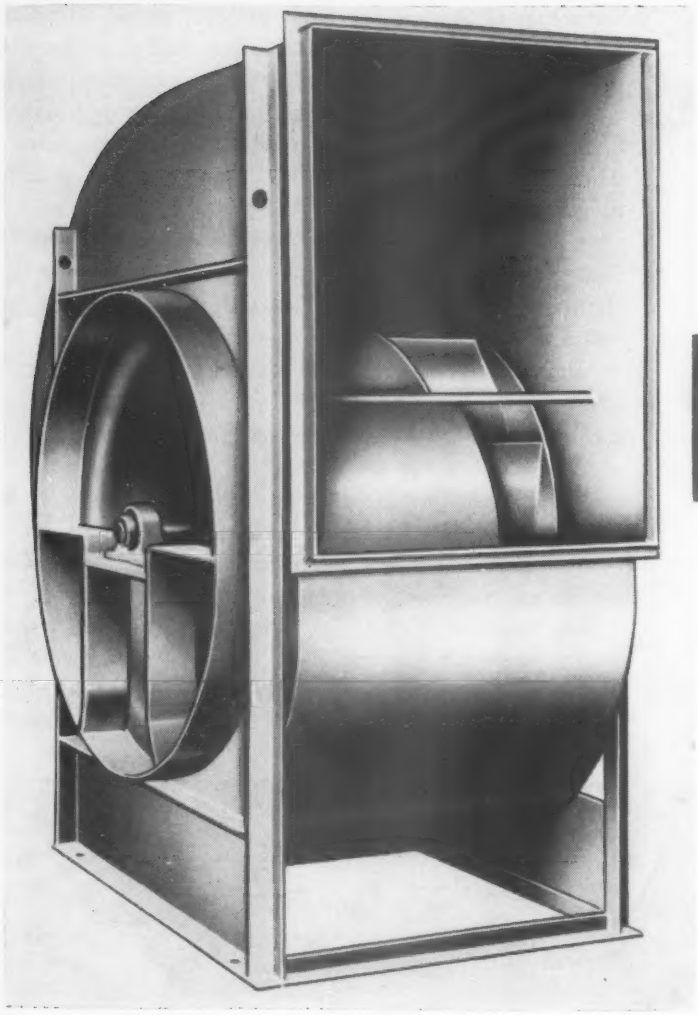
Duct construction for high velocity must be tight and of relatively smooth construction. Small leaks can mean considerable loss of air and increased noise. Inside of the duct should be free of sharp edges, which, because of the high velocity, will create noise.

Primary criteria for duct construction in either

(Please turn to following page)



This large return air fan is used in conjunction with a high velocity system.



A high efficiency airfoil bladed fan can be used in high or low velocity systems.

(Continued from preceding page)

high or low velocity systems are tightness of joints to prevent leakage and rigidity of the sides to reduce vibration due to air flow.

Vibration of the duct sides can be especially troublesome. A flat metal sheet has very little resistance to vibration. Even though reinforced heavily with angle iron, it can still be set in motion quite easily by air flowing over the surface. Very large ducts often require internal cross bracing in addition to external angles.

Cross breaking the flat side is a reasonably satisfactory solution to the vibration problem. However, this still leaves something to be desired, particularly on low noise level installations. Low frequency rumble can be a very annoying problem on such installations.

Round ducts have the advantage of prestressed metal such that the duct vibration is eliminated.

In either high or low velocity systems it is best to follow good construction practices. Duct fittings such as branch takeoffs, elbows, etc., should be well made with as few sharp edges as possible.

Turns should have as large a radius as possible and preferably should include turning vanes. Branch takeoffs should point upstream to retain as much as possible of the velocity head in the main stream.

It is always advisable to connect duct work to fan with a flexible canvas sleeve. This eliminates transmission of mechanical vibration to duct system. ▲▲

SUGGESTED REFERENCES:

ASHAE Guide: American Society of Heating, Refrigerating & Air Conditioning Engineers, New York City.

ASRE Data Book: American Society of Heating, Refrigerating & Air Conditioning Engineers, New York City.

Gilman, S. F.: "Pressure Losses of Divided Flow Fittings," *Transactions ASHAE*, Vol. 61, 281-295, 1955.

High Velocity Duct Design: Anemostat Corp. of America, N.Y., 1957.

Hoverkamp, F.: "Conditioning Multi-Room Buildings by High Velocity Air," *Refrigerating Engineering*, Sept., 1954.

How You Can Put Air To Work: Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

Wilson, C. M.: *Handbook of High Velocity Air Distribution Design*, Heating, Piping, Air Conditioning, Nov. 1954.

What's *your* opinion about . . .

Open, Closed and Base Bid Specs?

Here are opinions about open, closed and base bid specifications. Depending on whether you're an architect, engineer, owner or contractor, chances are you'll not agree with many of the conclusions reached by these other human elements involved with building specifications, and construction details.

OPINIONS ABOUT OPEN, closed and base bid specifications are mixed, to say the least. Depending on who you are, one or more of these types of specs "invite collusion", "are an easy out for consulting engineers", "may permit lowered design standards", "permits contractors to bypass consulting engineers with lower cost proposal to architect or owner", "assures (or does not) system performance".

These mixed opinions about three types of specifications were pointed up in questionnaires asking for a reaction to the article by M. J. Horsch, Giffels & Rossetti, chief specification writer, (see p. 45, Dec. issue) in which he compared open, closed and base bid specifications.

We have summed up these reactions from architects, consulting engineers, owners, manufacturers and contractors, in the table below.

An examination of this tabulation shows that architects and contractors agree, for example, that open specifications can be an easy out for consulting engineers, while consulting engineers, owners and manufacturers hold the opposite viewpoint.

Many other conflicting points of view are easy to spot in this tabulation, and one can almost tell what the respondent does from his answers to the questions. Since the tabulation of answers is self-explanatory, we will not worry this subject further. However, some of those who returned the questionnaire took that opportunity to express themselves more fully than the questionnaire would permit. It is these opinions which are most interesting and which reveal the conflict of interests among the various human elements involved in the design and construction of any large industrial or commercial building.

John Kline, American Air Filter Company, Inc.

I have read the script for the subject article entitled "Specifications: Closed, Open or Base Bid?". It is my opinion that this article was written specifically to condemn the base bid and alternate type specifications. The writer starts his article in a very general and very commendable form covering the closed specification, the open specification and is very fair in his comments concerning both types.

However, as soon as he gets to what he calls the third form of specification, the base bid specification, he really takes off. He immediately points out all the draw-backs that he can think of for this type specification and really slaps it around. This apparently is his message in the preparation of this article and in my opinion he is not being fair because he does not point out any of the advantages of this type specification nor even allow that there are buildings and types of equipment where this (base bid) specification is by far the best type which can be written.

In fact the apparent meat of this article is in point No. 4 under the base bid specifications where he makes the statement that "The base bid specification invites collusion". He goes even further than this by pointing out instances where this could have happened. Nowhere else in the article does he use any instances to bring out his points.

It would have been better in this article to have entitled it "What is Wrong with Base Bid and Alternate Type Specifications".

With the base bid and alternate type specification the owner with his architect and engineer can determine which type equipment he has decided should go into his building and dictate the price which will be paid. Any savings to be realized in this selection of equipment directly benefits the owner, not the contractor. This also gives the owner the chance of

(Please turn to following page)

(Continued from preceding page)

making all decisions concerning compromise if the bids exceed the appropriated funds.

If something must be done to reduce the overall cost of the building the choice is completely in the hands of the owner who is spending the money and who will occupy and use the building.

●

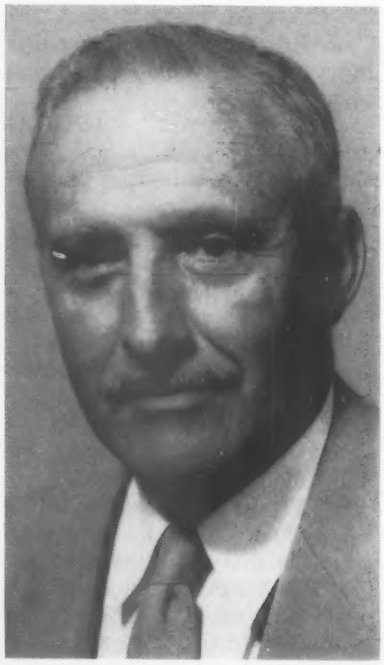
John E. Haines, Vice President, Minneapolis-Honeywell Regulator Co.

The article fails to describe one type of open specification which we have found to be the most satisfactory for the owner, engineer, and contractor. This is the type which names two, three, or four manufacturers whose equipment is known to meet the specifications, followed by: "or approved equal". This assumes, of course, that the specifications are clear and detailed concerning the requirements of the equipment, its installation, and its performance.

At times it may be of advantage to the engineer to omit the phrase "or approved equal" when two or more manufacturers are included in the specifications.

●

James E. Benedict, President, Benedict and Associates, Consulting Engineers



There is no single type of specification which suits all needs. One single project may, and possibly should, include all three types. Standardization of Maintenance and Repair should promote many closed specifications. Uniform Bids promote closed and Base Bid Specifications.

The open specification is a very difficult area because no specifying engineer can go into all of the details of any manufactured product and have a specification that all manufacturers can meet.

Design requirements are not the only criteria on which to base a specification be it open, closed or base bid.

Owners are looking for performance, not during an acceptance test, but for many years to come. Service facilities, parts availability, pride of representatives in their product, possibility of retirement of manufacturer from the area due to competition, the desire for repeat business etc., all enter into the writing of a given manufacturer into the specifications.

Therefore, all specification writers should before starting to write, know the owners needs and budget, preferably from a personal discussion, and determine which type of specification is most suited.

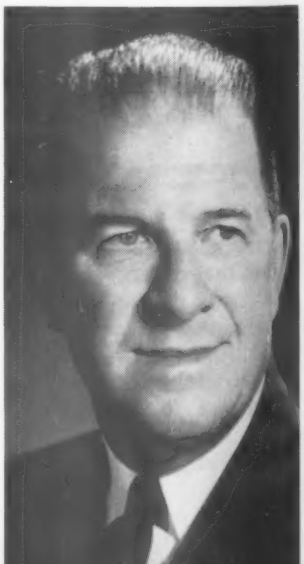
●

H. W. Rainey, General Sales Manager, Sturtevant Div., Westinghouse Electric Corp.

For our equipment these three types of specifications all leave something to be desired. No consulting engineer can be an expert on all manufacturers' products in certain lines. Why not list those manufacturers' products he does know and approve as "acceptable". This might be 2, 3, 4, or 5 or more, depending upon the product. This can allow ample competition, but on a *given quality level.*

●

Francis H. Buzzard, Executive Vice President and Treasurer, Charles S. Leopold, Inc., Engineers



Specifications vary greatly, depending on what they govern. The specification prepared only for the purchase of a single piece of equipment is prepared from a different standpoint than a specification for mechanical installations in a large building.

We all recognize that the open type specifications, particularly in Government work, makes the project suffer by the contractor purchasing the cheapest equipment that will just get by with the intent of the specification. Unfortunately, this also affects the workmanship of the project in that here, too, most Government specifications are prepared very loosely and open.

In the type of specification which we write, parts

of it are closed, sometimes part of it requires a base bid alternate on a particular item, and then again a part that does not make a great deal of difference is open, such as reference to Schedule 40 pipe where it does not make much difference who manufactures the pipe, as they have to comply with standards for this Schedule. This applies to many other conventional products that are openly specified.

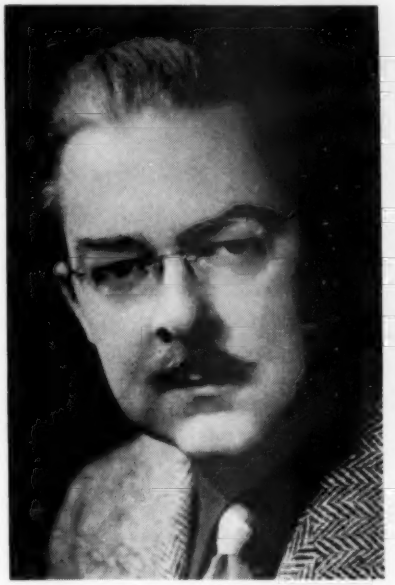
Referring to your "Evaluation Sheet", I must place more than one check alongside of the evaluation headings as I feel that the base bid and the closed specification for a large part go together.

Where you list "limits contractor's ingenuity", I presume you mean "buy out". Where you list "permits contractor to bypass consulting engineer with alternate (lower cost) design proposal to owner", I do not believe that anyone of the three specifications prevents this because if the contractor has a good contact with the owner or bank connection he can always try to use that influence.

Under the heading "requires many alternative bids", if the specification has many alternate bids then the engineer either does not know the cost of the project and is providing many alternates in order to cover himself in over-all cost, or the specification is poorly written and the engineer is not sure of himself.

Under the heading "permits supplier's engineers to do "free" consulting engineering", I do not believe there is any way this can be stopped, nor should it be stopped. Some of the largest manufacturers who may be mentioned in any one of the three types of specifications still have to do engineering on those projects where the owner is purchasing directly.

L. Morgan Yost, Yost & Taylor, Architects-Engineers



"When we specify base bid we are bothered with submissions which are *not* equal and spend too much time demonstrating why they will not comply with our intentions. This method is required on Capehart Military Housing, even so it is much better than Open Government specs as we do specify that which we'd prefer to have. We can save our client's money by careful design to incorporate a standard which works with our design. It "clicks" Manufacturers cannot usually understand how a change to another "equal" product may cost the owner more by changes in other parts of the structure to accommodate it. That is where we expend so much time and effort when we do accept an "equal".

●

C. J. Trickler, Chief Engineer, New York Blower Co.

All three methods of specifying need technical competence and open mindedness on the part of the

(Please turn to page 45)

* * *

TABULATION OF OPINIONS ABOUT OPEN, CLOSED AND BASE BID SPECIFICATIONS

	ARCHITECT			CONS. ENGINEER			OWNER			MANU-FACTURER			CONTRACTOR		
OPINIONS	A[1]	B[2]	C[3]	A	B	C	A	B	C	A	B	C	A	B	C
Permits full competition	yes	no	yes	yes	no	yes	yes	no	no	yes	no	no	yes	no	no
Fair to manufacturers	yes	no	yes	yes	no	yes	yes	no	yes	yes	no	yes	yes	no	yes
Easy out for cons. engineers	no	yes	no	yes	no	no	yes	no	no	yes	yes	no	no	no	yes
Assures system performance owner should expect	no	yes	yes	no	yes	yes	nc[4]	nc	nc	no	yes	yes	no	yes	no
May permit lowered design standards	no	yes	yes	yes	no	no	nc	nc	nc	yes	no	no	nc	nc	nc
Permits contractor to bypass consulting engineer with lower cost design proposal to owner or architect	yes	no	yes	yes	no	no	nc	nc	nc	yes	no	yes	nc	nc	nc
Invites collusion	nc	nc	nc	yes	no	no	nc	nc	nc	yes	yes	yes	nc	nc	nc
Permits "free" engineering by manufacturer's engineers	no	yes	yes	yes	no	yes	nc	nc	nc	yes	yes	yes	nc	nc	nc
Check type of specification you most often write, or prefer	x	x	x		x	x	x		x	x					x

Note: There were some architects, consulting engineers, etc., who checked off preferences other than denoted for their group, but the opinions tabulated herein express the majority opinion of each group of interests . . . architect, engineer, etc.

1. Open specifications. 2. Closed specifications. 3. Base bid specifications. 4. No comment.

This crusher exhaust system is equipped with a wet centrifugal collector to capture dust fines.

PART III

BETTER AIR

This month's article takes up features and applications of all types of wet and dry collectors for air pollution control in modern industrial processes.

INTENSIVE DEVELOPMENT WORK on wet collector designs started in the late 1930's. Collector designs now available emphasize the widespread field of application in high efficiency dust control problems to which collectors in this group are suited. Wet type collectors employ a multiplicity of methods to wet the contaminant and remove it from the air stream. A wide range also occurs in their cost, pressure drop, and collection efficiency.

Wet collectors offer advantages of constant exhaust volume, no secondary dust problem during disposal (a decided advantage where particles are under 10 microns), and an ability to clean high temperature and/or moisture laden gases. They are reasonably small in space requirements.

Collection efficiency varies with design, although most designs have a dropping off efficiency curve somewhere between 1 and 5 microns. Generally, a lower pressure drop means a lower initial cost, plus a lower efficiency in the minus 5 micron particle sizes.

Use of water introduces disadvantages. Costly corrosion resistant construction can be required for applications involving corrosive gases or material; water clarification necessary before disposal or reuse may be difficult or expensive.

Wet collectors have many applications such as cleaning air from kilns, roasters, coolers, dryers, handling fine dust, fumes, vapors, and mists released from operations in food processing, chemical industries, foundries and metal working, ceramics, rock products and metal mining.

Wet centrifugals. Typical of this group, collection relies on throwing heavier particles against wetted collector surfaces by centrifugal force. Water rates are usually in 3 to 5 gal per 1,000 cfm of gas cleaned.

Water distribution can be from nozzles, gravity flow or induced water pickup by air stream. Pressure drop will vary from 2½ to 6 inches and often a design will be offered in models having different numbers of impingement elements, sacrificing some collection of fine particles for lower cost, lower pressure drop, and smaller equipment.

Wet Dynamic. The wet dynamic precipitator, combines dynamic and centrifugal forces of a rotating fan wheel to cause contaminant to impinge

for INDUSTRY

by **Richard V. Sloan**
Senior Engineer
Industrial Division
American Air Filter Co.

Wet collector is installed on this metallic mining screen exhaust system.

on numerous specially shaped blades, on whose surfaces a film of water is maintained by spray nozzles at the inlet.

No external pressure loss is involved in collectors of this type, although their mechanical or blower efficiency is lower than conventional exhausters. For heavier dust loading, a wet type centrifugal precleaner is often used in conjunction with the precipitator. Water requirements range from 0.5 to 1 gpm per 1,000 cfm of gas cleaned.

Orifice Types. During the early 1940's, there were a number of manufacturers who introduced collectors in this group. Cleaning relies on the pickup or delivery of large water quantities to a collecting zone where centrifugal forces, impingement, or collision causes wetting of the contaminant before its removal from air stream. Water quantities in motion are high, running from 10 to 20 gal per 1,000 cfm. Much or all of this water, however, can be recirculated without the use of distribution spray nozzles or recirculation pumps.

Design simplicity has considerable appeal and absence of ledges, moving parts, or restricted passages makes such units especially adapted to materials like magnesium or explosive ducts, and for sticky or linty materials like metallic buffing exhaust. Many of the water wall spray booths incorporate elements of such collection principles, especially those designs where the pressure loss is in the 3 to 6-in. range. (See page 20, Dec. issue, for an article on these booths).

Highest Efficiency Wet Collectors. The national emphasis on air pollution control and need for wet dust collection equipment for sub-micron particles from high temperature gases, have resulted in the introduction of wet collectors with improved efficiency on particles under 1 micron.

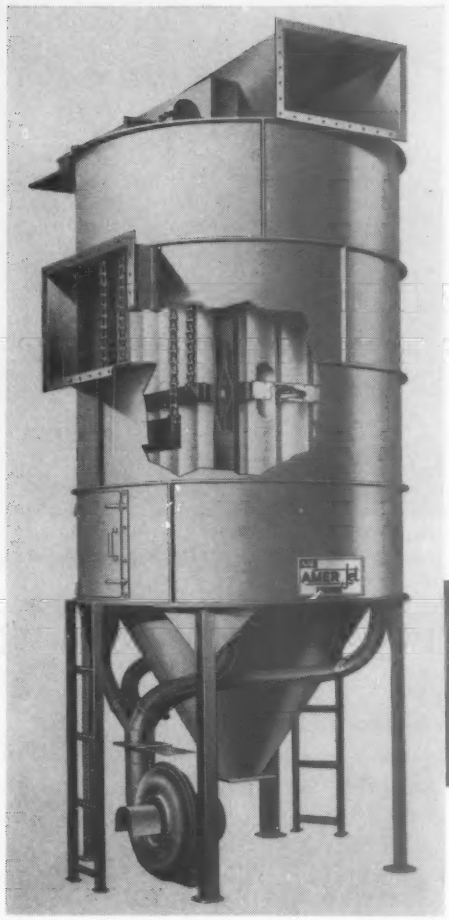
Major efforts have centered around means of breaking water droplets into finer particles to increase the probability from impaction and dispersion of contact between small contaminant particles, and water droplets or mist. Probability of this is highest where dust and water particles are the same size and where concentration of particles is high.

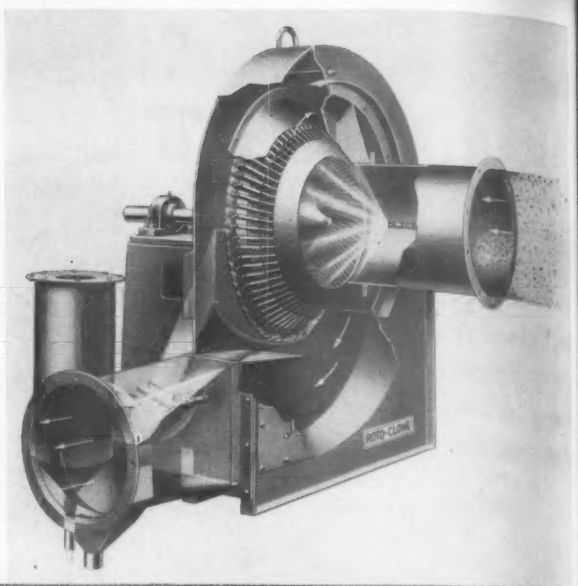
Two methods in commercial designs use either high pressure nozzles or high velocity venturies to break down water droplets to small size. High pressure nozzles are normally installed in lower types of centrifugal collectors.

A large number of small nozzles is involved, using water pressures of 250 to 600 psi and water volumes of 5 to 10 gal. per 1,000 cfm. Distribution of droplets must be such that dispersion increases chances of impact between water droplets and contaminant particle, rather than droplet against droplet to reform

(Please turn to following page)

At right: *Reverse jet type collector is installed on sugar beet seed cleaning exhaust.*





Above: *Wet centrifugal collector works by throwing heavier particles against wetted collector surfaces by centrifugal force.*

Left: *Reverse jet continuous arrester provides performance with reliability.*

(Continued from preceding page)

as larger size and less effective droplets.

Use of small nozzle orifices makes recirculation of water impractical for most industrial operations.

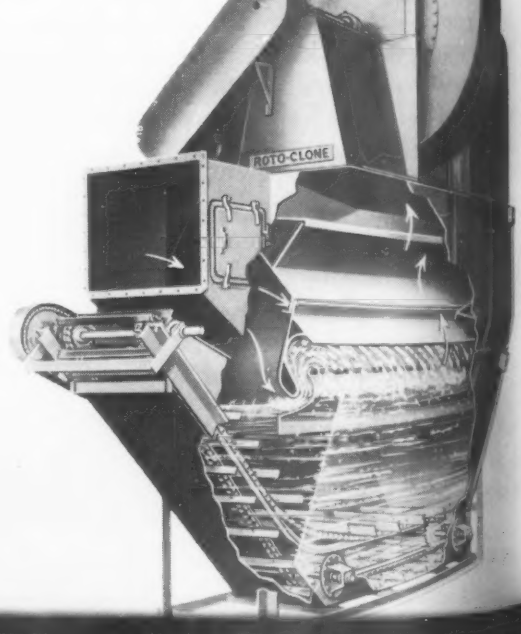
In the venturi design, shear stresses of the air stream traveling at velocities of 12,000 to 20,000 fpm are used to break up water introduced through open supply pipes in the venturi throat. Turbulence in the venturi is utilized to disperse and cause impact with contaminant within a short time interval. Space required for this design is small, recirculation of water is possible, but pressure loss is extremely high, usually in the 12 to 20 in. range.

In spite of the higher efficiency obtained by this group of wet collectors, their applications, except for certain industries and problems, have been considerably restricted. In spite of reducing the weight of escaping materials by 50 percent or more when compared with other wet collector designs, discharge will still be visible for many of the metallic fumes. Problems still remain where air pollution authorities have asked for practically invisible discharge appearance from such stack effluents.

With the tendency to focus discussion on present day need for high collection efficiency, importance of dry types of primary collectors is often overlooked. Collectors in this group will always find extensive industrial applications for coarser dusts from the following processes or industries: Woodworking, metallic grinding, polishing and buffing, grain dust and chaff from elevators, floor and feed mills, product collectors in pneumatic conveying systems, fly ash collection from spreader stoker and pulverized fuel boilers, primary collectors from dryers, coolers and kilns either in conjunction with final high efficiency collectors or as the only collector.

(Please turn to page 39)

Orifice type wet collector relies on pickup or delivery of large water quantities to a collecting zone where centrifugal force wets contaminant before removal from air stream.



Here are 3 unique ways . . .

Good Industrial Ventilation Design Pays for Itself

by James C. Barrett
Ventilation Engineer
Division of Occupational Health
Michigan Department of Health

Want to know how to ventilate automated heliarc welding processes . . . automatic buffing machines . . . brass melting furnaces? Here are proved methods that are actually in use and are practical, efficient and economical.

THE BASIC TOOLS FOR GOOD DESIGN of local exhaust ventilation are well known and readily available. The problem facing the ventilation engineer is to apply them to the job at hand and sell management on their value.

The three installations discussed in this article involve unique applications of proven and acceptable methods.

Two of these are unusual and show good application of engineering principles. The third is an accepted method of control, included here because ventilation engineers must prove to themselves again and again that their methods are practical, give good results, and create satisfied customers.

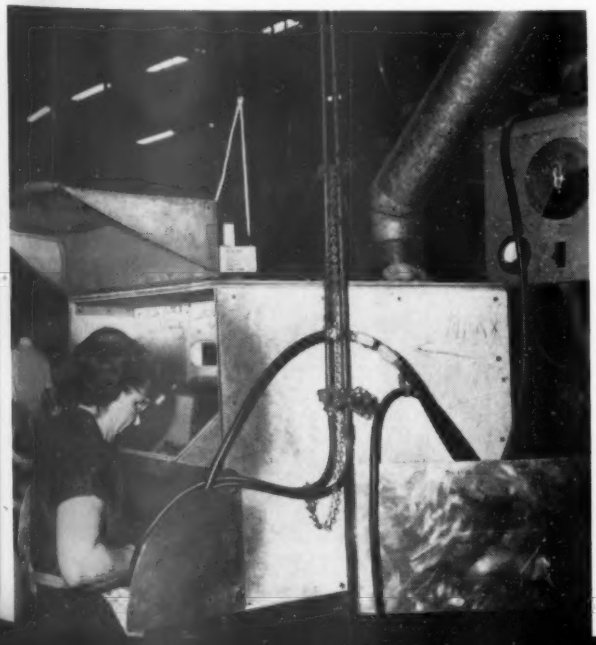


Fig. 1: *This production turntable for inert gas welding has glove-box enclosure for fume control.*

I. Many inert gas shielded arc welding operations lend themselves well to a total enclosure or glove-box design for fume control and ventilation.

This is illustrated at a plant engaged in the manufacture of fractional horsepower motors. The welding operations are involved in the fabrication of the laminated motor stators and rotors.

Ventilation used with a turntable production line is illustrated in Fig. 1. Individual pieces are assembled in small jigs. The turntable operates continually, bringing the pieces inside the booth.

Profile openings are well-baffled. The female operator sits on the outside of the booth, which measures 30 by 30 by 26 in. There is a 250-watt spotlight inside the booth. This gives sufficient light for the operator to position the 5/16-in. carbon arc rod before striking the arc.

Safety is provided through the use of a #9 grade olive welding glass window which can be seen in the inclined front edge of the hood. The small rectangle directly above that is a vanity mirror. Obviously this type of control appeals to the ladies!

Projection over the operator's head is a glare shield to minimize reflections on the face of the glass. The operator's arms are inserted through a 10 by 29 in. opening at the bottom of the hood. This is equipped with a canvas baffle, giving in effect a *glove box.*

Measured exhaust velocity is 80 fpm through the opening with the canvas raised. This corresponds to an exhaust of 100 cfm or the equivalent of approximately 12 changes per minute in the hood. Visibility

(Please turn to following page)

Fig. 2: *This production inert gas welding set-up on a straight production line, has canvas baffle, welding glass window shield, sufficient exhaust velocity to provide 30 changes of air per minute in the hood.*

(Continued from preceding page)

in the hood is no problem and there is no escape of fumes.

Fig. 2 shows a similar application on a straight production line. This booth is approximately the same size as the other. The two booths are fabricated out of transite on angle iron frames with flame proof asbestos curtains to baffle the openings.

The exhaust volume at this booth is 80 cfm giving a velocity of 65 fpm through a 9 by 20-in. opening with the curtain up. Again vision is through a #9 olive welding glass and a spotlight is provided inside the hood.

Fig. 3 illustrates a small welding jig. The exhaust hood is fixed in place and the jig is pivoted so that it raises for welding, automatically making the arc and closing off the bottom of the hood.

For loading, the jig drops away from the hood permitting easy access (Fig. 4). The hood measures 10¾ by 12 by 6 in. high and the exhaust volume is 57 cfm.

This technique should have considerable application for small automatic and semi-automatic shielded arc welding and will provide excellent fume control. One of our engineers is now working with a similar plant in developing a booth arrangement for an automatic heliarc operation. This arrangement will feature a sliding door with a microswitch to start the welder when the door closes.

II. It is generally accepted that complete enclosure provides the best ventilation for automatic buffing operations. This concept is neither new nor unique, still many of us find considerable opposition to this form of control. The principal objections seem to be that enclosures are too expensive, take up too much space, and are not worth the trouble.

Recently a plant in Michigan has gone to this form of control of automatic buffing. Their equipment is of the circular type and each of the three machines has four wheels of varying sizes. Two machines use wheels up to 6 by 12-in. diameter; the third has four wheels 18 by 18-in. diameter. Buffing compound is applied with automatic bar applicators.

Formerly control was attempted by the use of local exhaust hoods at the wheels themselves. This was ineffective and created considerable contamination throughout the plant. Dust concentrations were high and the parts waiting for plating were covered rapidly with accumulation of lint. Further, a sufficient accumulation of lint and airborne dust in the solution impaired quality and increased maintenance.

We made recommendations for complete enclosure following a study of dust concentrations in this plant. Each of the three machines is now provided with a complete enclosure as shown in Fig. 5. Each enclosure is flat across the face for most economical use of space and is rounded at the back. A walk-in access

Fig. 3: *Small welding jig with exhaust hood fixed in place. Jig pivots, raises for welding, automatically making arc.*

Fig. 4: Same welding set-up as in Fig. 3, this view shows how jig drops away from hood, permitting easy access. Exhaust volume is 57 cfm.

door is provided for routine maintenance.

The original local exhaust ventilation is still used and the enclosures are cleaned daily to minimize the accumulation of flammable debris.

Loading and unloading is done through the front opening which measures approximately 24 by 24 in. for two of the machines and 27 by 24 in. for the third.

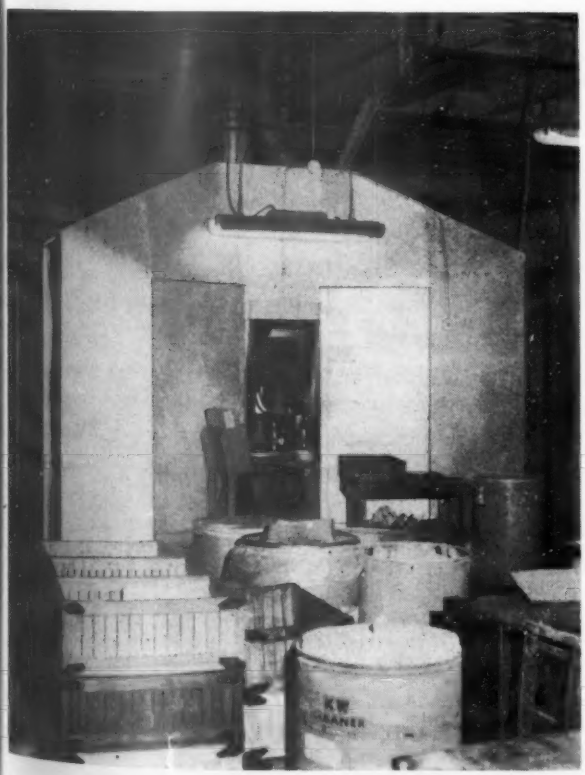
Face velocities of 700 fpm are maintained through two of the enclosures and 500 fpm is maintained through the fourth, giving a volume range of 2000 to 3150 cfm. Each enclosure costs $735 exclusive of the original cost of the local exhaust ventilation.

Good ventilation control has resulted in a minimum of maintenance of the plating solutions, has eliminated the need for secondary cleaning of various parts before plating, and was accomplished at a moderate expense.

III. For brass melting furnaces, lead and zinc fume and high temperature waste air are the obvious problems. In addition, due to the method of charging, one plant had a severe problem of greasy oily smoke.

The charge to their furnaces consisted largely of machine scrap, scrap forgings, and briquetted turnings. Much of this is highly contaminated with oil, resulting in a dense black plume when charged into the furnace.

This installation was designed as a part of a new furnace building for two Ajax Electric induction melting furnaces of 8000 lb. capacity and 400 kw. input.



The melting rate of each of these furnaces is 3500 lbs/hr and each furnace is charged with a separate skip hoist; the normal charge is 4000 lbs.

Limitations on the design included the use of an overhead crane in the high bay, tilt of furnace, and lack of sufficient clearance below skip hoist rails.

The design selected was a circular slot hood to surround approximately 270° of the furnace top. The top of the hood was to slope toward the furnace to form a hopper for the skip charge.

Fig. 6 shows one of the furnaces looking from the charging side with the hood in place and with the ventilation turned off. It is apparent that this is a severe operating problem. The flame is caused by the rapid burn-off of the oil in the charge.

Fig. 7 shows the same condition with the ventilation turned on. Now it is possible to see the skip hoist rails, the shape of the hood, and the open slot area. The slot is 3 in. high by 46 in. long and is open on the sides and closed at the rear near the take-off to provide distribution of air. The hood is constructed of 12-gauge hot rolled low carbon steel with the ends and bottom of ½ in. plate.

The design exhaust volume was 12,500 cfm per furnace at 800 F; this corresponds to 5250 standard cfm at a design rate of 1000 cfm per square foot of furnace top.

Fig. 8 is another view of the hood showing again the skip rails above and space limitations.

In order to maintain exhaust during the pouring operation the ductwork is designed with a rectangular

(Please turn to following page)

Fig. 5: *For automatic buffing wheels, best exhaust system makes use of complete enclosure, as shown at left.*

Fig. 6: *This view shows brass melting furnace with hood in place and ventilation turned off. Flame is caused by rapid burn-off of oil in the charge.*

Fig. 7: *Same hood as in Fig. 6, with ventilation turned on. Skip hoist rails, shape of hood and open slot area can now be seen.*

(Continued from preceding page)

slip elbow. Fig. 9 shows the furnace in pouring position and shows that there is a high degree of fume control during pouring.

Although this ventilation was designed to operate at extreme temperatures, the plant has experienced no great difficulties in its operation. It should be pointed out that the maximum temperature is not achieved over the entire melting cycle. This is a phenomenon connected with the oil saturated charge. Temperature peaks are found to exist only for 60 to 90 seconds after charging.

Hood life has been excellent. While there has been some distortion due to the fact that the hoods must also serve as hoppers, the original hoods are still in good condition after one year of operation.

Difficulty has been experienced with the elbow design, due primarily to the fact that the predicted furnace tilt was 45° and there was to be an automatic stop to limit the travel. However on one or two occasions the tilt limitations have been exceeded, causing some damage at the elbow.

Due to the high slot velocities there has been some entry of material into the exhaust system. Space limitations are such that the ductwork must travel under the furnace platform to a centrifugal fan mounted flush against outside wall of building and about 30 ft. vertically to discharge.

Due to the lack of space there is no room for an adequate trap. This material passes through the fan and is discharged from the system. Thus far there is no report of mechanical damage to the fan.

It is doubtful that with this method of charging and the space available, any other hood design could have been installed and it is doubtful that the air volume can be reduced. The slight difficulties encountered, therefore, are the price that this plant has to pay for effective ventilation.

We believe that this is an outstanding example of ventilation design that is geared to the original installation of the production equipment.

Each of these designs illustrates that we all have the basic tools for good design; the problem is to apply them to the job at hand and to sell management on their value.

The booth or glove-box approach is very practical for many industrial applications and we expect to see a number of these installations.

The buffing exhaust ventilation is not new; this job is remarkable for the results that have been achieved at relatively low cost.

The slot exhaust hood for the brass melting furnace, illustrates that good ventilation control can be obtained in spite of the limitations of the process and the materials that are involved. ▲▲

Fig. 8: *Same hood as in Figs. 6 and 7, giving another view of the hood, with skip rails above. Note tight space limitations.*

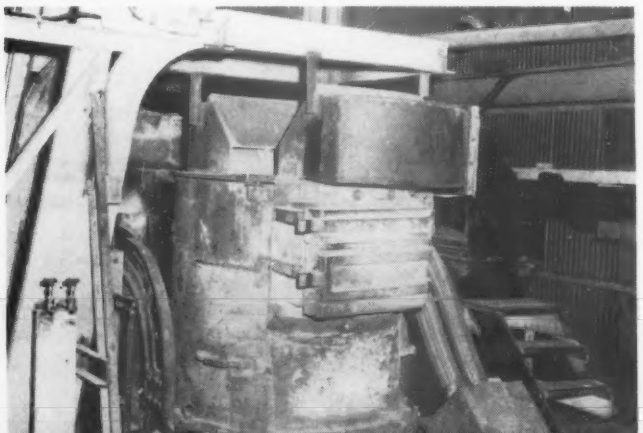


Fig. 9: *Furnace is shown in pouring position, showing a high degree of fume control during the pouring operation. Hood life is good, even though hoods double as hoppers.*

(Continued from page 32)

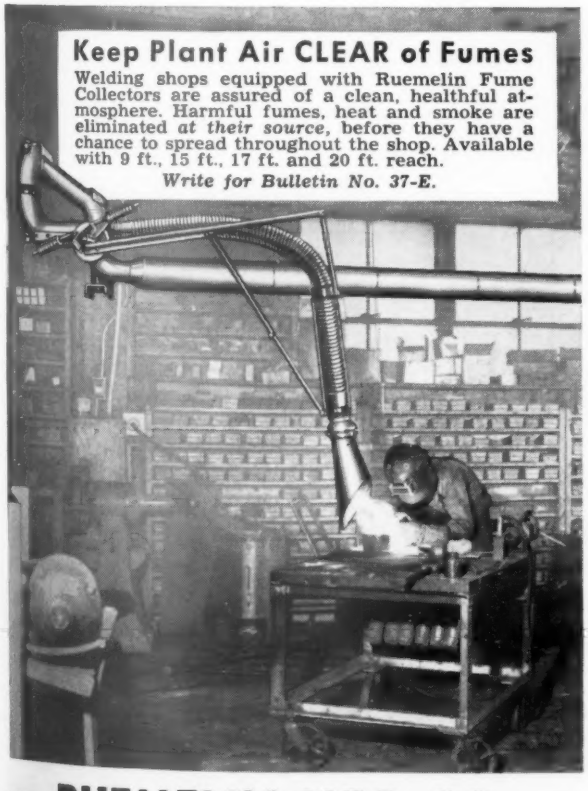
Better Air for Industry

Low Pressure Drop Cyclone. One of the earliest collector designs in this group is the well known and still extensively used cyclone which depends on centrifugal force to spin heavier particles against conical section of the collector and to force it out the dust outlet at the apex.

Collection efficiency is sensitive to variation in exhaust volume, and centrifugal forces available from angular acceleration reduce as the design is developed for larger air volumes. Collection efficiency usually drops off as particle size reaches 20 to 40 micron range, except where very heavy concentrations are handled in closed pulverizing circuits, and in other low pressure pneumatic conveying applications. Cyclones are low in first cost and have a low pressure drop of ¾ to 1½ inches.

Next month, more on dry centrifugal collectors, and data on the economics of air cleaning equipment and processes. ▲▲

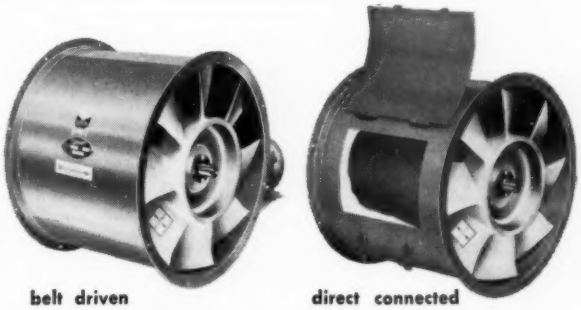
Use the addressed, postage paid cards in the Communications Center, page 37, for more information on new products, your comments about editorial material in this issue, suggestions for topics to be covered editorially, etc.


Keep Plant Air CLEAR of Fumes
Welding shops equipped with Ruemelin Fume Collectors are assured of a clean, healthful atmosphere. Harmful fumes, heat and smoke are eliminated at their source, before they have a chance to spread throughout the shop. Available with 9 ft., 15 ft., 17 ft. and 20 ft. reach.
Write for Bulletin No. 37-E.

RUEMELIN MFG. CO.
3048 N. PALMER STREET MILWAUKEE 12, WIS., U. S. A.
MANUFACTURERS AND ENGINEERS — SAND BLAST AND DUST COLLECTING EQUIPMENT — WELDING FUME COLLECTORS

high speed - high efficiency

Aerovent's new Tubeaxial Fan, designed around a new 8-blade "Macheta" Airfoil Axial Flow Propeller, offers top performance against medium pressures at speeds to 3450 RPM. Available in 16", 18", 24", and 30" diameters, this unit combines speed, stamina and modern functional design. Easily installed in present ductwork or engineered to new construction, it's the right answer for resistances to 4" SP. Another outstanding development from Aerovent—America's finest industrial fans and air equipment.



belt driven direct connected

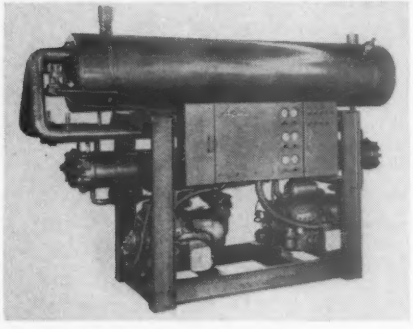
WRITE FOR FREE BULLETIN 350

Air deliveries of Aerovent equipment determined in accordance with established and accepted codes and guaranteed by manufacturer.

CERTIFIED PERFORMANCE

Aerovent FANS *Aerovent*
FAN COMPANY, INC.
ASH and BRIAN STS. PIQUA, OHIO

New PRODUCTS



Packaged Water Chillers With Twin Compressors

Purpose: To equalize wear and provide added protection.

Features: Individual motor for each compressor. Dual refrigerant circuits and control panels. Electric switch on control panel changes "lead" compressor.

HHD line ranges from 40 to 250 tons capacity.

Source: Acme Industries, Inc., Dept. AE, 600 N. Mechanic St., Jackson, Mich.

Miniature Photoelectric Pickups

Purpose: To permit electric eye counting and controlling units to be used in processing, printing, and machine controls in areas hitherto inaccessible.

Features: Overall size of photo unit and light unit is 1 13/16 in. by 1 5/16 in. and 11/16 in. diameter. May be mounted directly on ¼ in. pipe or any convenient stationary support.

Source: Photomation, Inc., Dept. AE, 96 S. Washington Ave., Bergenfield, N. J.

Atmospheric Particle Monitor

Purpose: Continuous monitoring of outdoor air or indoor atmospheres such as ultra-clean work areas.

Features: PC-200 presents, on a strip chart recorder, a permanent record of aerosols present in range

from 0.3 microns to any desired upper limit. Record is differentiated into 15 sub-ranges and recorded in sequence at predetermined intervals. Unit is continuously self-calibrated.

Alarm system indicates when particle concentration exceeds predetermined maximum. Price $6,975 f.o.b. Mountain View.

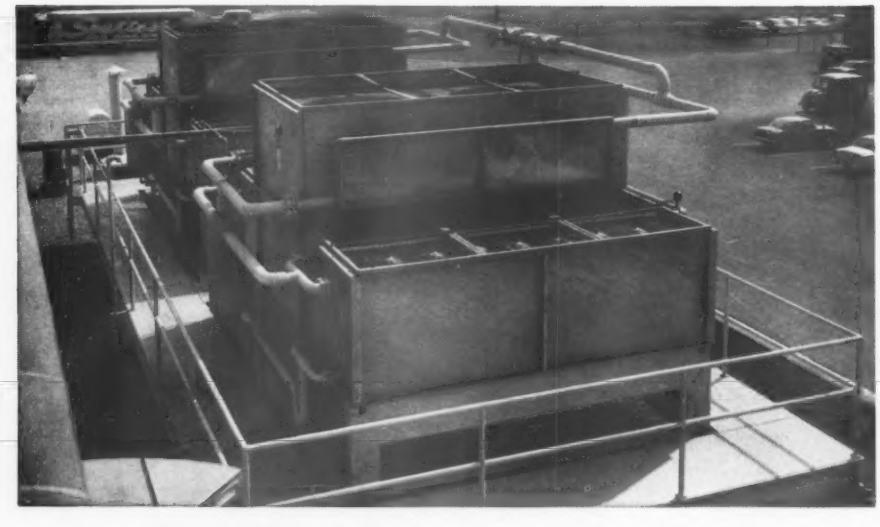
Source: Royco Instruments Inc., Dept. AE, 365 San Antonio Road, Mountain View, Calif.

Redesigned Tubular Centrifugal Fan

Purpose: Improved efficiency by 14 percent.

Features: Improved blading design to minimize turbulence and energy loss, more streamlined backplate, and modification of pressure vanes to match new rotor design. New static efficiencies range from 79 to 85 percent, depending on fan size.

Source: Dryer Electric Corp., Dept. AE, 164-166 Wallabout St., Brooklyn 6, N. Y.



MODERN NIAGARA CONDENSERS PAY FOR THEMSELVES IN EXTRA SAVINGS

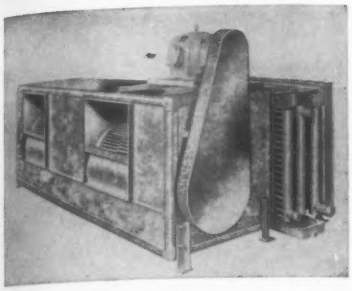
These Niagara condensers are lower in first cost and assure you of trouble-free automatic refrigeration. Special features: "Aeropass" coil removes super-heat to give you condensing at lower temperatures and prevent loss of capacity by the scaling of condenser tubes; "Oil-out", oil separator between pre-cooling and condensing coils gives you always an oil-free system; "Panel-Casing" construction gives you access to every part of the condenser for inspection and maintenance. Operating engineers say these condensers "save half the work of running a refrigerating plant". Managers who know costs and profits prove that Niagara condensers bring them great returns in power savings, water savings and reduced maintenance expense.

Write for Bulletins 131 and 142.

NIAGARA BLOWER COMPANY

Dept. AIR-2, 405 Lexington Ave., New York 17, N. Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

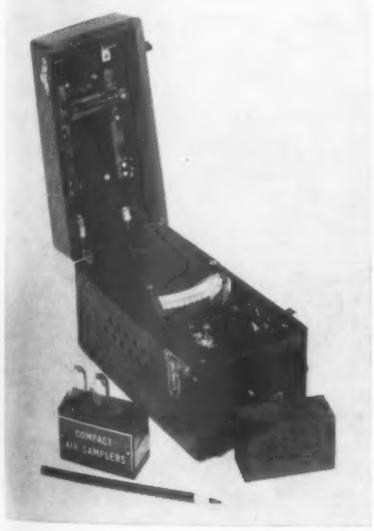


Air Handling Unit

Purpose: For air conditioning, ventilating, or heating and ventilating.

Features: Modular design with blower section independent of coil sections and top, bottom, or rear fan discharge. Class I wheels are standard, Class II are available. Rated from 800 to 34,000 cfm for direct expansion, chilled water, hot water, and steam.

Source: Recold Corp., Dept. AE, 7250 E. Slauson Ave., Los Angeles 22.



Compact Photoelectric Colorimeter

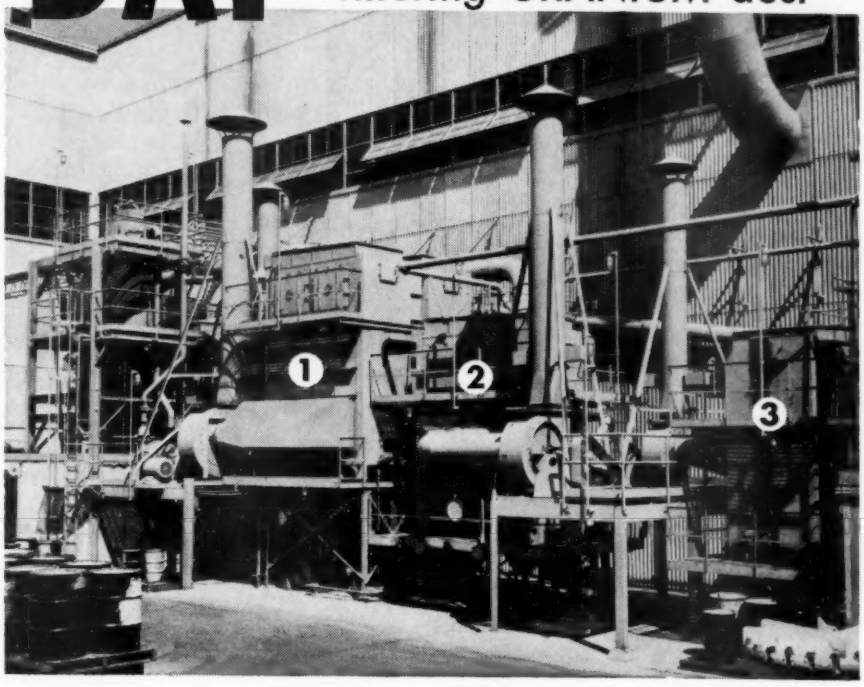
Purpose: To replace visual comparisons with objective readings in air pollution studies. For field use.

Features: Suitable for colors that range from blue green to red. Operates from four flashlight batteries and a single filter that transmits between 460 and 580 mu.

Source: Compact Air Samplers, Dept. AE, 825 Belmonte Park, N., Dayton 5, Ohio.

(Please turn to following page)

DAY ***plant proven*** *dust control filtering URANIUM dust*



3 DAY "AC" Dust Filters Serve MALLINCKRODT CHEMICAL WORKS

URANIUM DIVISION, AEC Weldon Springs Site

Shown above are 3 DAY "AC" dust filters. Filters No. 1 and 2 are collecting magnesium fluoride (M_gF_2) slag dust and U_3O_8 from slag grinding and similar operations. Filter No. 3, on the right, serves to filter uranium tetrafluoride (UF_4).

Equipment with high filtering efficiency is an imperative requirement for an installation of this type. These DAY filters meet this requirement. They capture sub-micron particles with 99.99+% efficiency because they are designed around the Hersey principle of air filtration which uses felted filter media. Filter media porosity is maintained automatically and continuously by high velocity reverse jet air. This assures stable back pressure.

Throughout many industries DAY equipment is preferred because it's *plant proven*. It means DAY not only offers high efficiency and pure, clean air but higher recovery of valuable product. DAY "AC" reverse jet filters are also preferred because they occupy a minimum of space and provide higher air handling capacities (4 to 5 times higher than non-reverse-jet type filters).

For more facts about the services and equipment DAY offers, consult your DAY application engineer, and for complete facts about DAY filters write toDAY for Bulletins F-75 and G-579. They contain helpful planning information and air engineering data.

The **DAY** *Company*

SOLD in UNITED STATES by
The DAY SALES Company
868 Third Avenue N.E.
Minneapolis 13, Minnesota

DAY SINCE 1881

MADE and SOLD in CANADA by
The DAY Company of Canada Limited
Rexdale (Toronto), Ontario, Canada
Fort William, Ontario, Canada

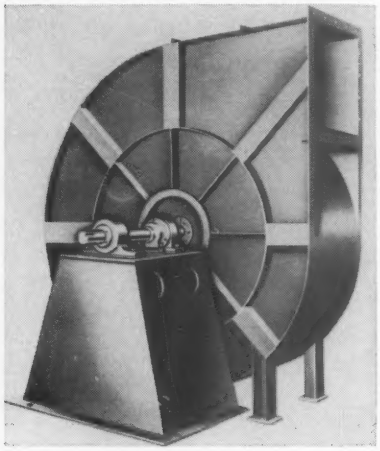
Representatives in Principal Cities

EXPERIENCE ENGINEERED . . . LABORATORY TESTED . . . PLANT PROVEN
Dust Control • Pneumatic Conveying • Bulk Storage
EQUIPMENT . . . SYSTEMS . . . INSTALLATION

New PRODUCTS

(Continued from preceding page)

Large Capacity Pressure Blowers



Purpose: For steel mill furnaces, product cooling, etc.

Features: Airfoil blading permits quieter operation and, with aerodynamic flow passages through wheel and housing, allows operation with motors smaller than necessary with flat-blade blowers. Series 2400 has 8000 to 64,000 cfm rating at pressures from ¾ to 2¼ psig.

Source: Westinghouse Sturtevant Div., Dept. AE(T-257), 200 Readville St., Hyde Park, Boston 36.

Polyester Plastic Filter

Purpose: Improved dust pick-up.

Features: Uses new and improved electrostatic polyester plastic fabric called Poly-Mag 80 which is produced exclusively for Stoddard Industries. Fabric is unaffected by humidity or by temperatures up to 230 F. Has higher resistance to shrinkage and lower pressure drop.

Source: Stoddard Industries, Dept. AE, Cudahy, Wis.

Portable Indicating Pyrometer

Purpose: To measure temperatures between -40 F and 200 F.

Features: Measures by means of two scales or arcs to provide 1 F per scale division and therefore readability to at least ½ F. Interchangeable thermocouples permit use for many different kinds of temperature measurements.

Source: Illinois Testing Laboratories, Inc., Dept. AE, 420 N. LaSalle St., Chicago 10.

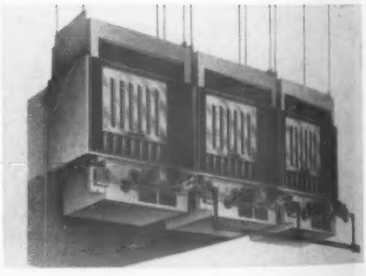
---

have you got the facts on money-saving preventive maintenance with

Torit dust collectors?

Clean machines hold close tolerances *better* and *up to 80% longer*. Result: a measurable saving in both the cost and frequency of servicing and maintenance work. You can protect your client's plant and equipment investment, help reduce potential production breakdowns, by specifying TORIT Dust Collectors. In the cabinet type (illustrated by cutaway drawing) filters are rated 99.99% efficient by weight on particles as small as ½ micron! Compact Torit high efficiency cyclone and cabinet type units are designed to save space, install anywhere. Your Torit representative will gladly give you dust collector specifications, performance charts, dimensional drawings and installation suggestions. Write:

TORIT MANUFACTURING CO.
1133 Rankin Street • St. Paul 16, Minn. • Dept. 1917



Gas Fired Duct Furnaces

Purpose: For use in air conditioning applications.

Features: Incorporates removable air by-pass baffles which eliminate the need for adding by-pass ducts to handle greater cfm required by most cooling systems. Stainless steel lint free burners; low voltage controls; aluminized steel casing; built-in draft diverters.

Available in six models from 75,000 to 300,000 Btuh input. Uses natural and mixed gases and LPG-air mixtures.

Source: Modine Mfg. Co., Dept. AE, Racine, Wis.

(Please turn to page 44)

Human Population Laboratory To Study Effect of Environment on Chronic Ills

A "human population laboratory project" to study chronic diseases, and particularly the effect of environment on chronic diseases, has been initiated by the California State Department of Public Health.

Financial support was sought and obtained from the National Institutes of Health of the U. S. Department of Health, Education, and Welfare, for financial support of a unique project designed to use the population of a selected area of the state for intensive epidemiologic studies of chronic diseases.

In attack on heart diseases, cancer, and other important chronic diseases, the epidemiologic method is essentially the same as for communicable diseases, it was pointed out, but the greatest emphasis now must be on the environment of the affected person and on his characteristics. Investigation of these aspects of disease occurence can point the way for clinical and laboratory research that could be fruitful in identifying the causative agent or agents.

The Human Population Laboratory Project will be under the direction of Lester Breslow, M.D., chief of the Bureau of Chronic Diseases; and the principal consultant to the project is Joseph R. Hochstim, Ph.D., who has joined the department staff recently for this purpose.

Use Communications Center, page 37, for requesting more information about articles, advertised products, literature, etc.

Cement Plant Installs Dust Collectors

Dust collection equipment, installed to make the plant acceptable to the community, form an important part of the new multimillion dollar electronically controlled and highly instrumented cement manufacturing plant which has been started up in Barberton, Ohio, by Columbia-Southern Chemical Corp.

Smoke and Soot Plague Jacksonville, Florida

"A morning haze of soot, smoke, and other pollutants blights the skyline of the Duval County metropolis (Jacksonville, Fla.) 30 to 50% of the time, health officials report," says a recent editorial in the Jacksonville *Florida Times Union*. "Complaints about odor, gas and dust in the air and paint damage to autos are frequent.

"The U. S. Health Service confirms that Jacksonville has the highest rate of air pollution in Florida. Unlike Los Angeles, where automobiles are blamed for a big part of the smog, Jacksonville has as its principal problem smoke and soot, from business and industry.

"The city health officer says about all his staff can do is 'request' operators of plants whose stacks blacken the atmosphere to correct the situation. The State Board of Health views air pollution laws as being '25 years behind water pollution control' in Florida.

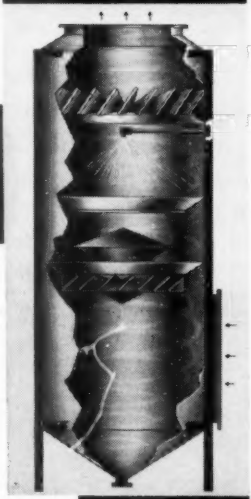
"The plight of Florida's No. 3 city cautions Tampa and other communities which woo industry to demand some form of smokestack control in the dowry."

FOR 99 PLUS % EFFICIENT CORROSIVE FUME REMOVAL and MAINTENANCE FREE OPERATION

CARPART (TYPE CF) FUME SCRUBBERS

500 cfm to 40,000 cfm Capacities

efficiencies on:
- CHROMIC ACID 99.4% to 99.8%
- SULFURIC ACID 99.4% to 99.5%
- BRIGHT DIP MIX 99.8% to 99.9%



Fabricated Entirely of Boltaron unplasticized PVC

- LOWER INITIAL COSTS!
- LOWER ERECTION COSTS!
- NO MAINTENANCE COSTS!

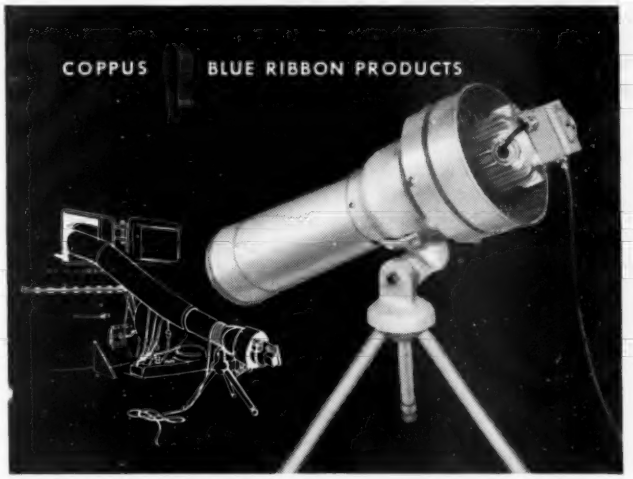
Effectiveness due to combination of 4 stage water curtain with baffled impingement and continuous centrafugal heavy particle separation.

For Engineering and Application Data on Boltaron PVC Fume Scrubbers and Plastic Exhaust Systems, contact . . .

CALL SAratoga 5-5144

CARPART CORPORATION Mfg. Div. OWOSSO, MICHIGAN

COPPUS BLUE RIBBON PRODUCTS



COPPUS "Blue Ribbon" Vano Ventilators are portable and easily adaptable to practically any "fresh-air" requirement in industry. Mail coupon below for facts.

COPPUS ENGINEERING CORP.
252 Park Avenue, Worcester 10, Mass.

- ☐ in tanks, tank cars
- ☐ in underground manholes
- ☐ for exhausting welding fumes
- ☐ on boiler repair jobs
- ☐ for general man cooling
- ☐ to stir up stagnant air wherever men are working or material is drying

Name.....
Company.....
Address.....
City.....

COPPUS BLOWERS

determine
DUST PARTICLE
SIZE DISTRIBUTION
below 60 microns

Micro-Particle Classifier No. 6000 with totally enclosed 220 volt, 3 phase motor operates at 3500 rpm. 16" high x 16½" diameter

with the
DIETERT-DETROIT
MICRO-PARTICLE
CLASSIFIER

Quickly determine sub-sieve particle sizes with scientific accuracy. The No. 6000 Dietert-Detroit Micro-Particle Classifier is widely used throughout industry for pre-testing dust collector needs, for determining the separating efficiency of air cleaners, for particle size control in many industrial processes and for scientific studies of fine materials. Mineral flours, metal powders, abrasives, fly ash, chemicals, drugs, etc., can be classified into eight fractions below 60 microns, (materials above 60 microns can be retained for sieve analysis). An eight-fraction analysis can be completed at the rate of 15 minutes per fraction by unskilled operators. Fractions are precisely defined and may be retained for accurate study. Gentle sifting action prevents particle fracture—assures accuracy and reproducibility.

8-page catalog mailed on request

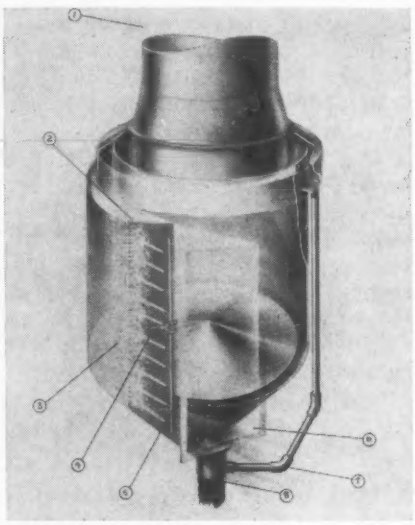
HARRY W. DIETERT CO.
CONTROL EQUIPMENT
9330 Roselawn Detroit 4, Michigan

Send me 8 page Micro-Particle Classifier bulletin—without obligation.

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ STATE_____

New PRODUCTS

(Continued from page 42)



High Energy Dust and Fume Scrubber

Purpose: Control acid mists, tar fog, petroleum coke dust, cupola fumes, catalyst dusts and other fine particles.

Features: Oriclone has adjustable rectangular orifice whose opening can be adjusted mechanically to obtain sufficient gas velocity to obtain desired efficiency. Combines separation and agglomeration in one unit of compact size.

Compactness results from fact that high energy at orifice is used to atomize, agglomerate, and separate the particles. Unit is available in capacities of 10,000 to 40,000 cfm.

Source: The Ducon Co., Inc., Dept. AE, 147 E. Second St., Mineola, L. I., N. Y.

Air-Cooled Blower Condenser

Purpose: For use in rooftop locations.

Features: Can be located anywhere without regard to prevailing wind. Upward air movement keeps noise to minimum. Shape offers safe psf loading. Models available from 5 to 53.5 tons.

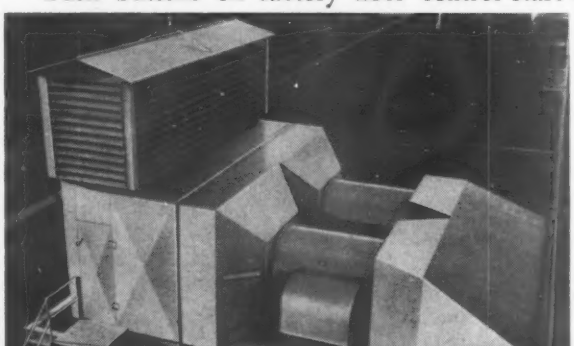
Source: Dunham-Bush, Inc., Dept. AE, 179 South St., West Hartford, Conn.

Industrial Gas Fired Package Unit

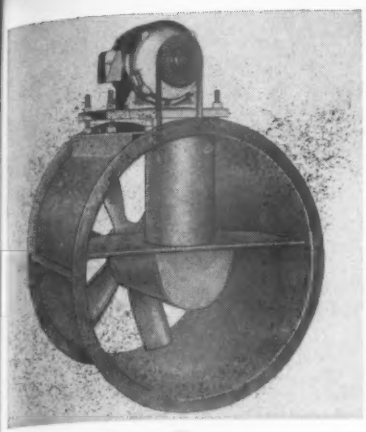
Purpose: Supply warm replacement air to plants starved for air due to evacuation by exhaust systems venting fumes, gases, and solid particles.

Features: Units available from 4,000 to 150,000 cfm. Air intake is from four-directional louver tower. Motor actuated dampers seal off ceiling air intake in combustion chamber, open when gas burner ignites.

Push buttons on factory floor control start and stop, otherwise unit operates automatically. Premix 15 million Btu Maxon gas burner with stainless steel baffle wings to protect flame and disperse heat into air stream, automatically adjusts to control flame.



Source: Metals Engineering & Mfg. Co., Inc., Dept. AE, 8820 Lyndon, Detroit 38, Mich.

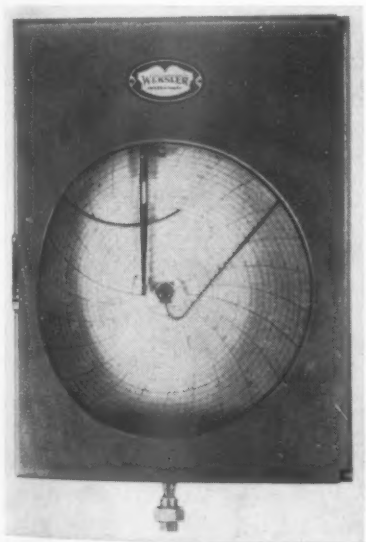


Fiberglass Duct Fans In New Sizes

Purpose: For use under corrosive conditions.

Features: Have corrosion resistance equal to or exceeding that of stainless steel or monel under many conditions. Now available in 12, 16, 20, 24, 28, and 36 in. diameters. Propeller, duct section, drive housing, and bearing cover are made of fiberglass. Drive shaft and hardware are stainless steel.

Source: Hartzell Propeller Fan Co., Dept. AE, Piqua, Ohio.



Recording Instruments for Temperature, Pressure, Humidity

Purpose: Easy reading, dependable accuracy throughout entire working range.

Features: Completely redesigned aluminum case with gray hammertone finish.

Source: Weksler Instruments Corp., Dept. AE, 195 East Merrick Rd., Freeport, L. I., N. Y.

Open, Closed, Base Bid Specs

(Continued from page 29)

specification writer. Ideally the owner has enough faith in the consultant's competence to back up his decisions whether made prior to the specification, or after bids are received.

There is no doubt that the "open" specification allows better use of competitive "bidding" and will result in best combination of quality and cost if consultant:

1—Is competent to judge the merits of competitive bids without "playing favorites".
2—Is open minded as to alternate proposals that suppliers feel are superior to the item specified.
3—Encourages contractors to search for suppliers and alternates he may have overlooked.
4—Knows the owner will back up his decisions.

Harold L. Alzo, Chief Specification Writer, Perkins & Will, Architects

The comment relative to "facts of life" and "would *see to it* . . . etc." show a woeful *lack* of knowledge of said facts. Such a man would be out of most engineers' specs from then on. ▲▲

Controlling Ink Mist

(Continued from page 23)

The electrostatic filters in the Pittsburgh Press installation are located at one end of the press room in a common duct. The dry type filters are at the other end. The electrostatic filter is cleaned twice a week with detergent and hot water. This is done manually at the Press, but can be done automatically.

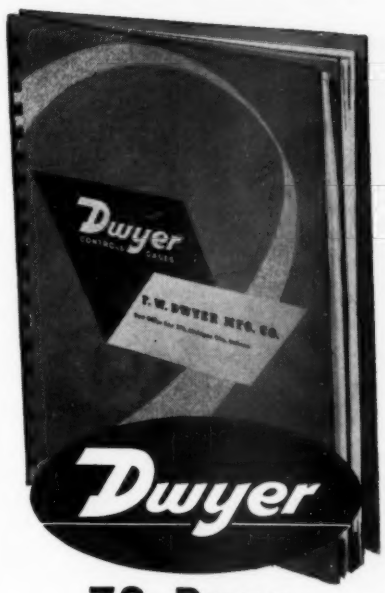
After cleaning, it was found that the unit "crackled." This small fire hazard is handled by a device which spews water in case of fire.

The modern web press, like the nuclear submarine, can run indefinitely, but without men they are ineffective. However, men work more efficiently in comfortable surroundings. Human operators of submarines and web presses require carefully engineered air circulation and filtration if they are to do their jobs well. ▲▲

Use Communications Center, page 37, for requesting more information about articles, advertised products, literature, etc.

FREE

to All Users of GAGES and CONTROLS



72-Page INSTRUMENT MANUAL

Contains:
- Illustrations and complete details of Dwyer
  - magnehelic gages
  - manometers
  - air meters
  - air filter gages
  - pitot tubes
  - pressure actuated switches
  - flowmeters
  - combustion testing instruments
- Diagrams
- Conversion curves
- Combustion efficiency charts

and other valuable technical data.

Send coupon for your FREE copy

F. W. DWYER MFG. CO.
P. O. Box 373 - A
MICHIGAN CITY, IND.

Please send me Dwyer 72-page catalog.

Name_____

Address_____

City_____ Zone____ State_____

INDEX OF ADVERTISERS

Aerovent Fan Co., Inc. 39
Agency: Mariva Industrial Advertising

Air Filter Corp. ..... *
Agency: Maercklein Advertising

American Gas Association ..... *
Agency: Ketchum, MacLeod & Grove, Inc.

American-Standard, Industrial Div..18-20
Agency: Brooke, Smith, French & Dorrance, Inc.

Barnebey-Cheney Co. 4
Agency: Odiorne Industrial Advertising, Inc.

Buell Engineering Co., Inc. 1
Agency: Hicks & Greist, Inc.

Buffalo Forge Co. 9
Agency: Melvin F. Hall Adv. Agency Inc.

Cambridge Filter Corp. ..... *
Agency: Richards & Webb, Inc.

Carpart Corp. 43

Carrier Corp. ..... *
Agency: N. W. Ayer & Son, Inc.

The Ceilcote Co. 2
Agency: Penn & Hamaker, Inc.

Chemical Construction Corp. ..... *
Agency: Van Brunt & Co.

Connor Engineering Corp. ..... *
Agency: William Schaller Co., Inc.

Coppus Engineering Corp. 43
Agency: James Thomas Chirurg Co.

The Day Co. 41
Agency: Scrymiger & Osterholt Adv., Inc.

Harry W. Dietert Co. 44
Agency: Watkins-Rogers, Inc.

Dracco Div. of Fuller Co. ..... *
Agency: The Jayme Organization, Inc.

The Ducon Co., Inc. 5
Agency: Sam J. Galley Advertising

Dustex Corp. 6
Agency: Comstock & Co.

F. W. Dwyer Mfg. Co. 45
Agency: Symonds, MacKenzie & Co., Inc.

Flanders Filters, Inc. ..... *
Agency: Snow & Depew, Inc.

The Green Fuel Economizer Co., Inc. ..... *
Agency: Rose-Martin, Inc.

Hartzell Propeller Fan Co. ..... *
Agency: Kight Advertising, Inc.

Illinois Testing Laboratories, Inc. ..... *
Agency: Kreicker & Meloan, Inc.

The Kirk & Blum Mfg. Co. ..... *
Agency: Baer, Kemble & Spicer, Inc.

Koppers Co., Inc., Metal Prods. Div. ..... *
Agency: VanSant, Dugdale & Co., Inc.

Lennox Industries, Inc. ..... *

Master Fan Corp. 13
Agency: E. K. Mowinckel Advertising

Wm. W. Meyer & Sons, Inc. 2
Agency: Slauf Advertising Agency

Mine Safety Appliances Co. ..... *
Agency: Ketchum, MacLeod & Grove, Inc.

Niagara Blower Co. 40
Agency: The Moss-Chase Co.

Pulverizing Machinery Div., Metals Disintegrating Co., Inc. ..... *
Agency: Williams and London Advertising

Research-Cottrell, Inc. ..... *
Agency: Michel-Cather, Inc.

Research Products Corp. 46
Agency: Ralph Timmons, Inc.

Ruemelin Mfg. Co. 39
Agency: Maercklein Advertising

Spraying Systems Co. ..... *
Agency: Advertising Producers-Associated

Stoddard Industries ..... *
Agency: The Caples Co.

Torit Manufacturing Co. 42
Agency: Kerker Peterson Hixson Hayes, Inc.

Western Engineering & Mfg. Co. ..... *
Agency: Willard G. Gregory & Co.

Western Precipitation Corp. 11
Agency: Dozier-Eastman and Co.

Westinghouse Electric Co., Sturtevant Div. ..... *
Agency: Ketchum, MacLeod & Grove, Inc.

York Corp., Subs. of Borg-Warner Corp. ..... *
Agency: Keyes, Madden & Jones

**Not advertising in this issue.*

Gives You MORE,
Costs You LESS
Check all the FEATURES!*

RP

Listed

Multi-Velocity INDUSTRIAL AIR FILTER

FOR HEATING OR AIR CONDITIONING

✶ **ALUMINUM** construction . . . rust-proof . . . corrosion-resistant. Eliminates need for expensive, heavy structural design in filter bank construction.

✶ **EASY TO HANDLE** Light-weight permits carrying, washing and installing of many more filters per hour.

✶ **EASY TO CLEAN** Lint and dirt are easily flushed off with water because of water soluble Super Filter Coat (the adhesive with the built-in detergent).

✶ **DEPTH LOADING** Designed to minimize surface loading, with depth loading accomplished through successive layers of slit and expanded aluminum, and varying baffle sizes.

✶ **REMOVES ODORS** Revolutionary R P Super Filter Coat adhesive adds odor removal to the normal dirt-trapping properties of R P Industrial Air Filters—with no increase in resistance—at *no* extra cost!

✶ **GERMICIDAL** Super Filter Coat adhesive contains Hexachlorophene, the well-known bacteria destroying agent.

✶ **LOWER RESISTANCE** Unique baffle design permits maximum air passage ...more uniform dust collection within the filter depth.

✶ **HIGHER EFFICIENCY** Scientifically staggered pattern of flat baffles sets up a controlled turbulence that centrifuges dust and odor particles onto the adhesive for maximum efficiency.

for information, write... RP / *Products of Research*

RESEARCH PRODUCTS *Corporation* Dept. 448, Madison 1, Wis.

PROFESSIONAL SERVICES

LAUREN B. HITCHCOCK ASSOCIATES
Chemical Engineers
Industrial Air Pollution Abatement
L. B. Hitchcock.....Edwin Cox
John H. Schaefer, Technical Adviser
60 East 42nd St., New York 17, N. Y.

CLASSIFIED ADVERTISING

RATES—Classified advertising is run in 6-point type (this size) under suitable headings. Minimum rate $5.00 for forty words or less. Extra words .15 each. Box addresses, with usual services, count as five words. Payment required with order.